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SEPTEMBER 1935

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THE PAN AMERICAN UNION

WASHINGTON, D.C.

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THE PAN AMERICAN UNION, originally known as the International Bureau of the American Republics, was established in the year 1890 in accordance with resolutions passed at the First International Conference of American States, held at Washington in 1889–90, and presided over by James G. Blaine, then United States Secretary of State. Its work was greatly expanded by resolutions of the Second Conference at Mexico in 1901; the Third at Rio de Janeiro in 1906; the Fourth at Buenos Aires in 1910; the Fifth at Santiago, Chile, in 1923; the Sixth at Habana, Cuba, in 1928; and the Seventh at Montevideo, Uruguay, in 1933. It is an international organization created and maintained by the twenty-one American republics. Its purpose is to develop closer cultural, commercial, and financial relations between the Republics of the American Continent and to promote friendly intercourse, peace, and better understanding. It is supported by annual contributions from all the countries, in amounts proportional to population. Its affairs are administered by a Director General and Assistant Director, elected by and responsible to a Governing Board composed of the Secretary of State of the United States and the representatives in Washington of the other American governments.

The administrative divisions of the Pan American Union are organized so as to carry out the purposes for which it was created. Special divisions have been created on foreign trade, statistics, finance, and agricultural cooperation, all of which maintain close relations with official and unofficial bodies in the countries, members of the Union. Particular attention is devoted to the development of closer intellectual and cultural relations among the nations of the American Continent, and administrative divisions have been created for this purpose.

The Pan American Union serves as the permanent organ of the International Conferences of American States, usually referred to as the Pan American Conferences. In addition to preparing the programs and regulations, the Union gives effect to the conclusions of the Conferences by conducting special inquiries and investigations and by convening or arranging for special or technical conferences in the intervals between the International Conferences.

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From "Charles Darwin's Diary of the Voyage of H. M. S. 'Beagle' ", edited by Nora Barlow. Copyright. Reproduced by permission of the Cambridge University Press and The Macmillan Company.

CHARLES DARWIN.

The hundredth anniversary of the memorable visit of Charles Darwin to the Galapagos Islands occurs in September 1935. This portrait, sketched by an unknown artist, pictures him four years after the return of the "Beagle" to England.

BULLETIN
OF THE PAN AMERICAN UNION

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DARWIN AND THE GALAPAGOS ISLANDS

By Edward A. Chapin, Ph. D.

Curator of Insects, United States National Museum,

and

Clara Cutler Chapin, M. A.

On a cloudless day in September of 1835 an eager, ruddy-faced young man clambered over the jagged black lava cliffs of a tropical island and felt that life was good. He was a thin young man, six feet tall and with a trace of a stoop even at 26, but his muscles had been hardened by four years of tropical and antarctic exposure, and he could outclimb some of his more powerful looking shipmates. He was a thinking young man, with sensitive features. Thick bushy eyebrows overhung his clear bluish-gray eyes, and the softest of brown hair grew above his high forehead. Four years aboard ship had given him a wavy brown beard, but the mouth above it was finely chiselled, and the blue-gray eyes had lost not a bit of their longing to learn.

Besides his fly-net, his pistol and his compass, the young explorer carried a small pocket notebook and a pencil. Very little escaped that industrious pencil. He noted the lava, black in the mass but reddish where it was most porous; it stretched out ahead of him in deep-cut waves that looked as if some inky ocean had been suddenly turned to stone in the very midst of a tempest. He noted the scrubby little bushes that grew on the lower slopes of the island. From a distance they had looked leafless and wintry, but as he bent over them he saw that there were tiny leaves and even some dull little blossoms to add to his collection. He climbed higher and noted the thick green vegetation, beginning about a thousand feet above sea level, and growing more thickly on the damp windward side of the island. He noted the wealth of birds, the paucity of insects, the many turtles,

the huge lumbering land tortoises a yard across the shell, and the ugly clumsy lizards, two or three feet long and as black as the lava of the beach where they were crawling. Alone except for the sailor servant whom he had taught to shoot his specimens and prepare his bird skins, he pushed inland, returning to the beach only after hours of painstaking observation had sped by like minutes. So much to see! So much to note and collect!

Riding at anchor off the island was the deep-waisted little barque that had sent the two ashore and would have a ship's boat waiting for them at the appointed time. A 242-ton barque does not look big from the cliffs of a rocky island. This one, however, was big enough to occupy a very large place in history, for she was the historic ship *Beagle*, four years out of England on a voyage of scientific exploration. On this day in September 1835, she was making her long-to-be-remembered call at the Galapagos Islands before turning toward the Pacific Ocean and the home voyage.

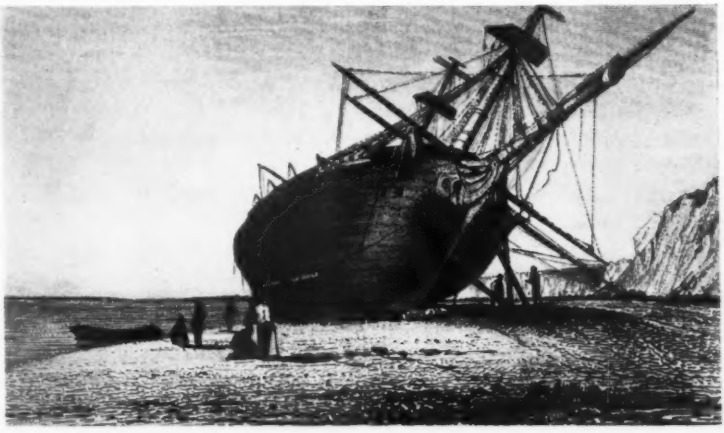
The earnest young collector was the ship's naturalist, Charles Darwin. This was not the Charles Darwin whose calm, benign old features were familiar to our grandparents as they read of pilgrimages to the Kentish home of the world's greatest scientist. This was an untried youth, fresh from Cambridge University—tireless in his labors, yet scarcely daring to hope that the results of his observing and collecting and study might in some way be found worthy of the notice of real scientists.

Even at the time, this visit to the Galapagos Islands seemed important to Darwin. Two months earlier he had written from Peru to one of his best friends of Cambridge days: "I look forward to the Galapagos with more interest than any other part of the voyage." [1] And in after years, years of continued study and experimentation and meditation in his quiet English home, the month which the *Beagle* had spent in this strange equatorial group of islands began to look more and more momentous, both to Darwin himself and to the world of science. Viewed in the light of its results, the achievements which grew out of it long afterward, that month may not unfairly be regarded as the high light of the whole five years of the *Beagle's* memorable voyage, perhaps even of the long and fruitful life of Charles Darwin himself.

For out of the astonishing assortment of birds and reptiles and plants which he found on those islands grew the young student's first grave doubts of some of the basic principles of natural history as then accepted. And out of those early doubts grew the 20 years of study which blossomed forth in the crowning achievement of Darwin's career—his theory as to the development of life forms. Before he

[1] Darwin, Francis, "Life and Letters of Charles Darwin." 1888. vol. 1, p. 234.

had been back in England a year, he set down in his small personal diary: "Had been greatly struck from about the month of previous March on character of South American fossils, and species on Galapagos archipelago. These facts (especially latter) origin of all my views." [2] Seven years later he wrote to his intimate friend and co-worker Hooker, the great botanist: "I have been now ever since my return engaged in a very presumptuous work. . . . I was so struck with the distribution of the Galapagos organisms, etc. etc. . . . that I determined to collect blindly every sort of fact which could bear any way on what are species." [3] And 15 years after this, in 1859, came "The Origin of Species".



THE "BEAGLE" ASHORE.

This engraving from "Voyages of the Adventure and Beagle" pictures the latter as she was careened in the Santa Cruz River, Argentina, for minor repairs. Continuing the voyage, the 242-ton vessel reached the Galapagos Islands 17 months later.

Comparing his copious notes, the young explorer found that such animals and plants as exist at all on this Pacific group of islands are not exactly the same as the animals and plants on the continent of South America, and yet are astonishingly similar. He also found that the animals and plants on any one of the principal islands in the group are different from the animals and plants on neighboring islands, set off by 50 miles or so of deep ocean waters—and yet they are almost like them, far closer than to animals and plants anywhere else in the world, even those of South America. Here were the facts, neatly arranged in as complete a little biological demonstration as ever graced a laboratory—a natural history exhibit whose like has been

[2] *l. c.*, p. 247.
[3] *l. c.*, p. 384.

found nowhere else in the world. They were waiting, as they had long waited, for a trained eye and mind to come and make use of them.

By 1835 the eye and mind of the young Charles Darwin had become sufficiently keen to seize upon them. Darwin came of a studious family, he had been educated at a famous old university, and he had had the advantage, in his undergraduate days, of intimate walks and talks with some able men of science. But more, perhaps, than by these early influences, his abilities had been sharpened by his four years aboard the *Beagle*, and his determination that not one hour of that precious opportunity should be wasted.

The invitation to sail with the *Beagle* as the ship's naturalist had come to an amiable boy of 22, freshly graduated at Cambridge, and still pursuing a leisurely course of studies intended to fit him, eventually, for a place in the Church of England. This sociable young man, much as he loved partridge-shooting and gay little undergraduate supper-parties, loved even better to walk into the countryside collecting rare and interesting species of insects and plants. Collections of this kind had been his private hobby from his first days at boarding school. In fact, he had learned so much from them that at Cambridge older and wiser men were glad of his company. It was a pleasure to scholarly botanists and geologists to have this wide-awake student join their walks and take part in their discussions on the workings of the world of nature. Chief among these "faculty friends" had been Prof. John Stephens Henslow, to whom Darwin was always deeply attached. It was Prof. Henslow who in 1831, shortly after Darwin's graduation, was invited to name a naturalist to go on the *Beagle's* long voyage of scientific investigations. Prof. Henslow immediately named his young friend of the walks and talks. No words can describe the boy's delight when he finally won his father's permission to go on this voyage. "What a glorious day it will be to me! My second life will then commence, and it shall be as a birthday for the rest of my life."[4] It was too good to be true! His pet self-indulgence would now become his first duty!

The *Beagle* sailed in December 1831 with its 22-year-old naturalist in high spirits. A narrow space at the end of the chart table in the poop cabin was assigned to him for working and dressing, and for sleeping, also; his hammock was one of two to be slung above the table. A few small drawers in a corner held his clothes, but the top drawer had to be taken out to make room for the hammock whenever it was hung: space was precious aboard the little *Beagle*. Another small cabinet was assigned to his specimens.

The object of the voyage was "to complete the survey of Patagonia and Tierra del Fuego, commenced under Captain King in 1826 to

[4] *l. c.*, p. 187.

TWO ISLANDS OF THE GALAPAGOS GROUP.

Engravings in Captain FitzRoy's "Voyages of the Adventure and Beagle, 1831-36", thus depict two of the larger islands in the archipelago. Upper: Isabela or Albemarle Island. This, the largest, has an area of approximately 1,650 square miles. Lower: Santa María or Charles Island. Here the voyagers on the "Beagle" found a settlement of Ecuadoreans, established 6 years previously.

1830—to survey the shores of Chile, Peru, and of some islands in the Pacific—and to carry a chain of chronometric measurements around the world."[5] While the ship's officers and men were busy with these long and exacting tasks, Darwin had time for his own independent shore expeditions to study the geology, botany and zoology of this new field. Sometimes a few of his shipmates would arrange to go with him, sometimes he would be alone with native guides or would travel with acquaintances he had made among the gentlemen of the region. The first half of 1832 was spent on the ocean crossing and on shore trips around Bahia, Rio de Janeiro, Buenos Aires and Montevideo. The next three years were devoted to a thorough study of the coasts of Patagonia, Tierra del Fuego and Chile, ending with a couple

[5] Darwin, Charles, "Journal of Researches." 1905. p. 11.

months in Peru. There were many long trips in small boats or on horseback, and almost innumerable excursions to the deserts, villages, forests, mines and mountains of that far southern end of the great South American continent.

The enthusiastic youth who embarked on the voyage had been frankly bewildered by the wealth of material before him. He did not know whether he was noting the right facts. He wondered what sort of information would be likely to be useful to the scientists who, he

A SHORE LINE OF LAVA ROCK.

The coast lines of the islands are usually of red and black lava rock, in wave-like boulders or rugged cliffs. There is little or no vegetation in the lower altitudes.

hoped, might find his labors of some service. The answer was to note everything, and this he proceeded to do. His zeal was not daunted by intense heat, bitter cold, or the severe seasickness that pursued him around the world. After four years of unflagging industry he could still write to his sister: "A man who dares to waste an hour of time has not discovered the value of life." [6]

No wonder there were results. Out of those years came many specimens and great piles of careful notes, and out of those years there came also an able scientist, who had but lately been an amateur.

[6] Darwin, Francis, op. cit. vol. 1, p. 237.

Young Darwin had acquired the purpose in life that he had so obviously lacked in Cambridge days: "It appears to me the doing what little we can to increase the general stock of knowledge is as respectable an object in life as one can in any likelihood pursue."[7] By September 1835 he had also acquired the sound judgment and scientific self-confidence that enabled him to see and read the story set forth in the significant groupings of birds, beasts and plants which awaited him in the Galapagos Islands

The first landing was on the island of San Cristóbal (Chatham), the island nearest the mainland and the one that is now used as the seat of island government by the Republic of Ecuador. With Covington, his sailor attendant, Darwin made inland climbs on this 24-mile island from several of its many bays. They cut through its intricate thickets or made their precarious way over fields of lava craters, whose truncated hillocks, rising 50 to 100 feet above the plain, smelled like smothered stoves and looked to the exiled Englishman like the chimneys of the iron furnaces of Staffordshire. One night they slept on the beach instead of returning to the *Beagle*, and so were able to use every bit of daylight next day.

After a week at San Cristóbal the *Beagle* proceeded to the island of Santa María (Charles). Here the voyagers found not only nature but man. A small six-year-old settlement from Ecuador was established several miles inland, at a height of about 1,000 feet. They also found mud, black mud, and how they did rejoice at the sight after the parched soil of Peru and northern Chile. On San Cristóbal they had been astonished at the fearlessness of the birds: "The birds are Strangers to Man & think him as innocent as their countrymen the huge Tortoises."[8] On Santa María the birds were just as tame, in spite of the fact that a colony of men had been living on the island for six years. Not far from the settlement of thatched pole houses Darwin saw a boy sitting by a spring and using a little switch to kill for his dinner the birds that came down to drink.

After a brief visit at Isabela (Albemarle), the largest island in the group, the *Beagle* stopped at San Salvador (James Island). Here Darwin and four others were put ashore to camp on the island for a week. They pitched tents in a little valley not far from the beach and explored the island from there. At two or three thousand feet above sea level, the earth was damp and vegetation bright and green. There was even a spring with cold water.

Here, as on San Cristóbal and Santa María, there were great numbers of the big tortoises, slow and placid, and so heavy that several sailors tugging together could scarcely lift one. The tortoises had

[7] *l. c.*, p. 218.

[8] Darwin, Charles, "The Beagle Diary". Nora Barlow, edit. 1933. p. 334.

made well-beaten paths to the upland spring. Many were returning, happily full of the cool water, and many others were clumping slowly up, their necks stretched out toward the feast ahead. They were making perhaps 360 yards an hour (Darwin timed one with his watch); and when they reached the spring they buried their heads above the eyes in the muddy water and sucked in great mouthfuls, about 10 gulps to the minute. Darwin and Covington made a two-day visit to this green upland region of San Salvador, and during those two days they lived on the meat of the tortoises, fried in rich oil from the fat with which the creatures are so abundantly supplied.

Down on the beach they found the sand so hot that it almost burnt through their thick shoes; Darwin could not measure the heat be-

Courtesy of Charles Haskins Townsend.

TORTOISES ON ISABELA ISLAND.

The giant land tortoises that abounded on the islands at the time of Darwin's visit are now practically extinct, because of the inroads made upon them by whalers of early days in search of food, and by oil hunters of a later period.

cause his thermometer would register only up to 137°. But in the open air the thermometer stood at 85° strangely cool for low land only forty miles from the equator.

Collecting, climbing, and a trip to a salt lake in the bed of an old crater made the week on San Salvador pass all too quickly. On October 17 the *Beagle* called for the five campers, and then, after three days devoted to surveys among the smaller islands, she set her

course sturdily toward the long Pacific crossing. In one year more Darwin was again in England.

For three years after his return, the traveler worked over his voluminous notes and put them together in the form of a narrative. In 1839 was first published Darwin's own story of what he saw on the *Beagle's* famous voyage around the world. Under its various titles — *Journal of Researches*, *Voyage of the Beagle*, *A Naturalist's Voyage* — that story has become a classic.

But Darwin had brought home material for more than a story. The years that followed the publication of his journal were filled to the brim with scientific studies, experimentation and writing; his appetite for investigation had only been made the more keen by that early voyage. And through all those years of study the ideas that he had brought home from the Galapagos Islands were growing bigger. He built them up by experiment, he tried them out on his own constantly increasing knowledge of the world of nature, and above all he thought about them, year after year.

Those islands were in the Pacific. They were volcanic islands. But their flora and fauna were not like the flora and fauna of other Pacific islands or of other volcanic islands. They were so consistently close to the flora and fauna of South America that botanically speaking, zoologically speaking, the islands were part of America. Again, what grew on one of those island was always just a bit different from what grew on the others. The tortoises, for instance: there was nothing like those tortoises anywhere else in the world—and yet the tortoises were different on the different islands, so different that the far from learned settlers on Santa María could tell by looking at one which island the creature had come from. So with the birds and the flowers — different from each other, and yet vastly more different from the birds and flowers of all other parts of the world.

Darwin resolved to search the world of knowledge for information that might throw light on this problem. He collected every sort of fact that could bear on his subject, mountains of facts. He read pages and pages of agricultural and horticultural books. He pondered the theories of an older Cambridge graduate named Malthus, on the struggle for existence among men. Was there a parallel to that in the world of nature? That neat little assortment of living things on the Galapagos Islands was too complete to mean nothing. There must be some explanation.

In 1859, in *The Origin of Species*, he offered his explanation. He built it around three facts which had been known so long that everybody, learned and ignorant alike, took them for granted. Heredity, variation, and multiplication, he said, are the three keys to this riddle. We all know that offspring resemble their parents, animals

and plants no less than humans. We all know that there is variation; different children of the same parents are sure to show some small differences among themselves. We all know that more offspring are produced than survive. Unlimited multiplication means that there must be competition for the things that make life possible. Some will survive and some will not.

Among these many variations some will be better adapted than others to the conditions in which the animal or plant has to live. The individuals who show these better-adapted variations will be more likely to survive than the others, and in this way the favorable variations will tend to be preserved.

Over a long period of time the accumulated effect of these variations must be very great indeed, said Darwin; see how much has been accomplished artificially, even in the very short time during which farmers have been practising methodical selection among the breeds of domestic animals and plants. The differences upon which nurserymen and breeders of animals base their choice are often so slight that an outsider can hardly see any at all, yet the sum total of those differences carried through several generations produces changes that are obvious to everyone. How great, then, must be the total effect of the slow accumulation of the many, many slight variations which have been naturally preserved because they are well adapted to the environment! Geology shows us what inconceivably long periods of time there have been for these variations to pile up in.

The most complicated adaptations may result from the summation of a long series of simple favorable variations. Varieties become subspecies, sub-species in time become true species, and so on. "Natural selection" was the name Darwin gave to this slow and steady process, although he once told a friend he almost wished he had called it "natural preservation" instead, to throw more emphasis upon the method by which the selection is actually accomplished.

An epoch-making book had grown out of that early voyage. And lest there be any doubt about the connection between the two, Darwin began his very first paragraph: "When on board H. M. S. *Beagle*, as naturalist, I was struck with certain facts in the distribution of the organic beings inhabiting South America, and in the geological relations of the present to the past inhabitants of that continent. . . . On my return home it occurred to me . . . that something might perhaps be made out on this question by patiently accumulating and reflecting on all sorts of facts which could possibly have any bearing on it."[9] Something had at last been made out, and it was something big.

[9] Darwin, Charles, "The Origin of Species." Hurst & Co., n. d., p. 1.

A GALAPAGOS LAND TORTOISE (TESTUDO VICINA).

This specimen in the New York Zoological Park was brought from Isabela (Albemarle) Island 30 years ago, since when it has increased in weight from 140 to 305 pounds. Its shell measures 3 feet 10½ inches over the curve.

Courtesy of the New York Zoological Society.

Courtesy of the New York Zoological Society.

SEA IGUANAS FROM THE GALAPAGOS ISLANDS.

Interesting reptiles are the sea iguanas of the Islands, a species unknown elsewhere in the world. Never wandering from the coast line, they feed entirely on sea lettuce, an alga found on the rocks at low tide. Exceeding the land iguanas in size, some males have been found to reach a length of 5 feet and weigh as high as 22 pounds.

If Darwin were alive and well on this hundredth anniversary of his memorable month on the Galapagos Islands, he would lose no time in paying a second visit. This second call would be a call of felicitation. He would hasten to express to the authorities who govern those islands, and particularly to Señor Egas, whose farseeing leadership has accomplished so much, the delight with which the whole world of science has greeted the measures which have been taken to guard these unrivalled treasures. The Government of Ecuador has now thrown its protection around the wild life of the Galapagos Islands by making it unlawful to kill, capture, injure, or even disturb any of the rare tortoises, lizards, seals and birds, or their nests or eggs, on any of these islands. The forbidden species are: the fur seal (*Arctocephalus galapagoensis*), the sea lion (*Otaria byronia*), the marine iguana (*Amblyrhynchus cristatus*), the terrestrial iguanas (*Conolophus subcristatus* and *Conolophus pallidus*), and the terrestrial tortoises (*Testudo abingdoni*, *Testudo darwini*, *Testudo wallacei*, *Testudo ephippium*, *Testudo porteri*, *Testudo chathamensis*, *Testudo hoodensis*, *Testudo elephantopus*, *Testudo phantastica*, *Testudo gunteri*, *Testudo vicina*, *Testudo microphyrs*, *Testudo becki*). Furthermore, the Government of Ecuador has set apart as reserves or national parks, to serve as an inviolable refuge for all animal life, either resident or migratory, the following islands in the group: Española, San Salvador, Pinzón, Santa Fe, Rábida, Seymour, Daphne, Tower, Marchena, Pinta, Wenman and Culpepper, and a part of Isabela. In order that these measures may be duly carried out the same decree further forbids "yachts, steamers or . . . boats or airplanes of any description . . . to land any person on any of the islands of the Galapagos without having obtained legal permission in Puerto Baquerizo Moreno on the island of San Cristóbal." This is a step which is destined to mean much, not only to the animal life of the Galapagos Islands, but to the science of zoology throughout the world.

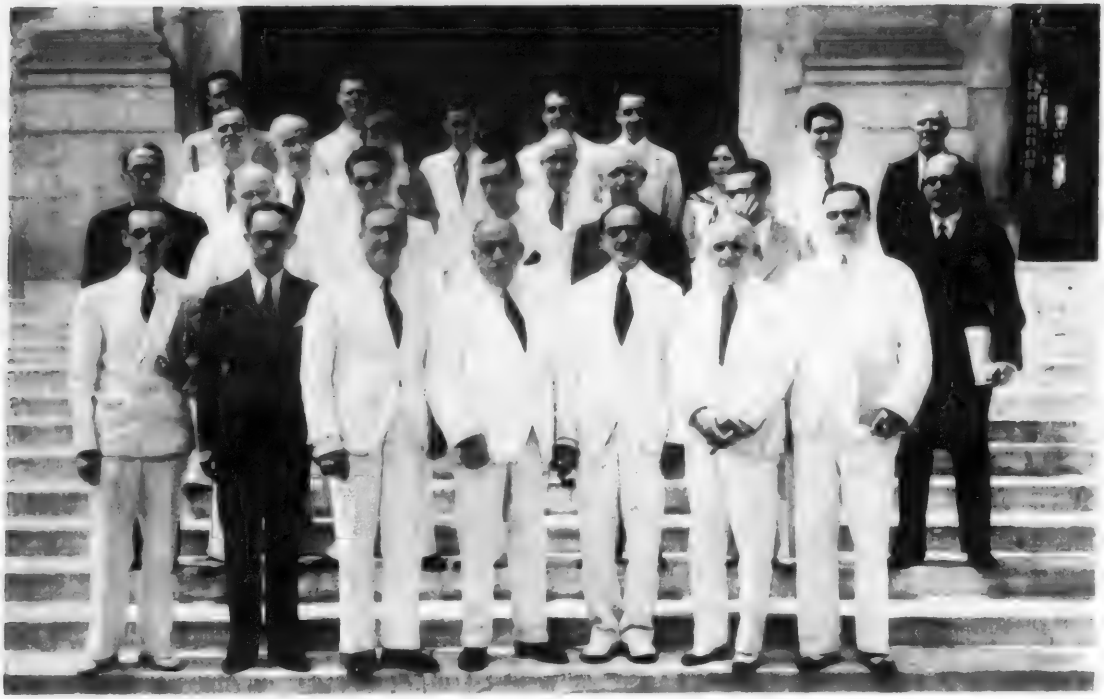
A COMMISSION OF THE SOCIAL-ECONOMIC UNION OF CUBA VISITS WASHINGTON

LAST February, as the result of a meeting in Habana attended by representatives of Cuban labor, capital, agriculture, industry, and organizations representing various economic activities in the Republic, the Social-Economic Union of Cuba was formed. Entirely unofficial and nonpolitical in character, the Union was planned as a permanent body to cooperate with the United States in carrying out the provisions of the Reciprocal Trade Agreement signed August 24, 1934, and the Costigan-Jones Act, which provided for the allocation of quotas among the several areas supplying the United States sugar market.

On August 12, 1934, a distinguished commission of 18 members from the Union arrived in Washington to discuss informally both with officials and with representatives of American trade and labor organizations matters of mutual interest and to express their appreciation of the policy of economic cooperation pursued by the Government of the United States in its relations with Cuba. The commission was greeted on its arrival by the Hon. Sumner Welles, Assistant Secretary of State, and other officials of the State Department.

At noon the commission was received by the President at the White House. At this time the chairman of the commission, Señor José Manuel Casanova, president of the Social-Economic Union, gave to President Roosevelt a testimonial, signed by 320,000 Cubans, expressing their approval of the measures adopted by both countries to expand trade between them. The document and signatures were contained in three handsome boxes of Cuban hardwoods. The President manifested his warm appreciation of this gift, and his pleasure in the beneficial effects of the steps taken to promote Cuban-American commerce.

The visitors called upon the Hon. Cordell Hull, Secretary of State, and the Hon. Henry A. Wallace, Secretary of Agriculture. They also met and conferred with other officials of the Government as well as of business and labor organizations.



THE COMMISSION OF THE SOCIAL-ECONOMIC UNION OF CUBA AT THE PAN AMERICAN UNION.

This photograph, taken August 14, includes members of the Commission and the Director General and Chiefs of Division of the Pan American Union.

On Wednesday the commission visited the Pan American Union. The Director General, Dr. L. S. Rowe, welcomed the visitors and outlined for them the history of the institution and its administrative organization. Dr. Rafael María Angulo, president of the Press Association of Cuba, replied gracefully in the name of the commission, after being introduced by the president, Dr. José Manuel Casanova.

On the evening of the commission's arrival the Hon. Sumner Welles was host at dinner to the Cubans and other distinguished guests. The Ambassador of Cuba, Dr. Guillermo Patterson y de Jáuregui, gave a luncheon in their honor the following day and on Thursday held a reception for them in the Cuban Embassy. The commission entertained their official and unofficial hosts at the Mayflower Hotel on Friday afternoon before they left for Habana.

The commission was composed of the following prominent Cubans:

Sr. José Manuel Casanova, president of the Social-Economic Union of Cuba, president of the National Association of Sugar Mill Owners of Cuba, 1st vice-president of the Cuban Institute for the Stabilization of Sugar.

Sr. Antonio Antón, 1st vice-president of the Social-Economic Union of Cuba, president of the Joint Committee of Economic Corporations.

Sr. Benigno Rodríguez Sánchez, 2nd vice-president of the Social Economic Union of Cuba, technical counselor and delegate of the Association of Cane Planters of Cuba.

Sr. Ángel Garri, 4th vice-president of the Social-Economic Union of Cuba, president of the National Federation of Economic Corporations.

Dr. Rafael María Angulo, 6th vice-president of the Social-Economic Union of Cuba, president of the Press Association of Cuba.

Dr. Arturo M. Mañas, general secretary of the Social-Economic Union of Cuba, general secretary of the National Association of Sugar Mill Owners of Cuba, member of the Cuban Institute for the Stabilization of Sugar.

Sr. Alfredo O. Ceberio, general secretary and legal adviser of the National Association of Manufacturers of Cuba, technical counselor of the Cuban Government in the negotiations of the Reciprocal Trade Agreement between Cuba and the United States.

Sr. Edelberto Farrés, treasurer of the Social-Economic Union of Cuba, member of the Cuban Institute for the Stabilization of Sugar, delegate of the Association of Cane Planters of Cuba.

Dr. Ricardo Morán, member of the Executive Committee of the Social-Economic Union of Cuba, delegate of the Chamber of Commerce of the Republic of Cuba, general secretary of the Association of Fruit and Vegetable Growers and Shippers of Cuba.

Sr. Ceferino Martínez, member of the Executive Committee of the Social-Economic Union of Cuba, general secretary of the Federal Union of Labor of Cuba.

Sr. José F. Barraqué, member of the Executive Committee of the Social-Economic Union of Cuba, president of the *Empresa Naviera de Cuba* (Maritime Corporation of Cuba), member of the Board of Directors of the Habana Produce Exchange.

Sr. Germán Becl, ex-secretary of the Railroad Brotherhood of Cuba.

Sr. Julio Mederos, member of the Executive Committee of the Social-Economic Union of Cuba, president of delegation no. 3 of the Railroad Brotherhood of Sagua, delegate of the Railroad Brotherhood of Cuba.

Count del Rivero, member of the Executive Committee of the Social-EconomicUnion of Cuba, president of the *Diario de la Marina* Publishing Co.

Dr. Julio D. Montero, member of the Board of Directors of the Association of Wholesale Tobacco Jobbers and Growers, member of the National Commission of Propaganda in Defense of Habana Tobacco.

Sr. Guillermo Pérez Lavielle, member of the Executive Committee of the Social-Economic Union of Cuba, delegate of the Association of Journalists of Habana, commercial editor of *El Mundo*, manager of *Noticiero Mercantil*.

Sr. Agustín Lazo, editor of the *Diario de la Marina* and *Avance*.

Sr. Hugo Mamelis, member of the staff of *El Pais* and *Noticiero Mercantil*.

THE CAPITOL, HABANA

THE DIRECTOR GENERAL AND ASSISTANT DIRECTOR OF THE PAN AMERICAN UNION ARE HONORED BY THE CUBAN GOVERNMENT.

The National Order of Carlos Manuel de Céspedes in the rank of Grand Office and Commander, respectively, was recently conferred upon Dr. L. S. Rowe, Director General of the Pan American Union, and Dr. E. Gil Borges, Assistant Director, in recognition of their services in the cause of international friendship. His Excellency, Dr. Guillermo Patterson y de Jáuregui, Ambassador of Cuba in Washington, made the presentation.

TRAVELING THROUGH CUBA

By C. R. Cameron

American Consul General, Habana, Cuba

MATANZAS, the first important city east of Habana, may be reached by rail or by the Central Highway, an excellent automobile road of concrete which connects all the provincial capitals of Cuba. Via the latter, Matanzas is 63 miles distant, measured, as are all distances on this highway, from the diamond in the marble pavement under the dome of the new capitol building. The route apparently follows old roads, being shaded, near Habana at least, with ancient laurels and towering flamboyant (*Delonix regia*) trees. In other sections young trees of various species have been planted, obviously about the time of the construction of this section in 1929. As one approaches Matanzas there appear on the left various abrupt hills, notable among them being the southwestern end of the *Pan de Matanzas*, visible to mariners many miles away. Geologists explain that the Cuban coast sank under the sea and rose again, and that the foundations of the coral reefs which constitute the upper strata of the recently elevated coast in this vicinity, being harder than the calcareous formations upon which they rest, have been worn away by the action of waves and rivers, leaving many detached hills locally known as *mogotes*. Indeed, on the top of some of these, one finds exposed coral reefs resembling those appearing on many beaches near Habana.

The first view of Matanzas as the highway surmounts the lip of its basin is attractive, but the most striking vistas are obtained from the elevation of Monserrate which overlooks both the beautiful Yumuri Valley on the north and the bay and city of Matanzas, with its 42,000 inhabitants, on the south. Matanzas exports quantities of sugar and molasses, importing petroleum products, fertilizer, flour, etc., and has recently secured national legislation establishing a free customs zone on the west side of the bay, where it is hoped to attract manufacturing industries using imported raw materials.

To go from Matanzas to Cienfuegos the traveler may motor over the highway to Esperanza, and then southward over a branch road, 37 miles farther to his destination, known also as the "Pearl of the South". The journey may also be made over the lines of the United Railways, which operate 46 percent of all public service railroads in Cuba, in a car having movable wicker chairs, more comfortable in many respects than Pullman accommodations. The territory traversed is composed largely of porous limestone, covered in many places

by red and black clays of great fertility where sugar and other crops grow riotously. A weathered plain with alternating fields and groves stretches at times to the horizon, with occasional hills of coral rock, and at Jovellanos begins the level area which extends almost uninterruptedly from Sagua on the north coast to Cienfuegos on the south. The landscape in western Santa Clara is characterized by abundant palm trees—not, however, the stately royal palm so characteristic of the most of Cuba, but rather the fan-leaf palms and palmettos.

The city of Cienfuegos is situated on the northwest slope of the shore of a peninsula running into the magnificent Bay of Cienfuegos, 20 miles long and landlocked so closely that the entrance requires skillful navigation. The city has a population of about 37,000, and is a port of importance, exporting annually many millions of dollars' worth of

MAP OF CUBA.

The solid line indicates the Central Highway and the dotted line the route traveled by the author. He made his trip entirely by automobile except for the section between Antilla and Santiago, where he used an airplane.

sugar and molasses, and importing flour, cotton textiles, coal, etc. The Cuban National Aviation Company offers daily airplane service with Habana and Santiago, while clipper ships making the run from Miami to the Panama Canal call here twice a week each way. The wealth of the contributory territory is wholly agricultural, producing not only sugar, coffee, and cattle, but a considerable amount of tobacco, of which the most famous brand is Manicaragua, grown in the mountains to the east and north of the port.

One of the sugar plantations near the city was visited. Here a tract of 30,000 acres, splendidly situated on a river which furnishes cheap water transportation to Cienfuegos Bay, is devoted to sugar, producing daily during the season (beginning January 15) about a thousand 325-pound sacks of sugar until its quota is reached, and for each sack of sugar about five gallons of the "final molasses" so widely used by the manufacturers of alcohol in the United States. The

molasses is stored in tanks, transported in tank-cars, and shipped in tank ships. The jute sacks for the sugar are imported from India.

Sugar cane growing from the planted joints of cane is ready for harvesting in 15 to 18 months, and ratoons from last year's stubble in 12 months or less. The fertility of Cuba's soil is such that many successive crops may be harvested from the stubble without replanting, five or six crops being common, while 20, 30, or even 50 have been recorded. Cane is cut close to the ground by machetes, the cutter developing an extraordinary skill which enables him to sever the cane, trim off the dry leaves, cut the stalk into suitable lengths, and throw the pieces into a nearby pile, all in one almost continuous movement. From the pile, the cane is "lifted" by the cutter to the carts and hauled, usually by four or six yoke of oxen, to the nearest cane switch of the company's railway, where by means of a crane the load is lifted in a sling, weighed, and dropped into a railway car for transportation to the mill.

Not far from Cienfuegos, also, is the Arnold Arboretum in which Harvard University is interested. The arboretum is destined for the investigation and improvement of tropical plants, especially citrus fruits, and for the training of Harvard students in tropical work, some of them being in residence there for several months every year. Its garden has an area of about 80 acres with 3,300 plants of various kinds, including such curiosities as the chaulmoogra shrub of Burma, the source of the most successful remedy for leprosy yet discovered; the ylang-ylang, a Philippine tree producing the well-known perfume of that name; nutmeg trees, etc.

Photograph by C. R. Cameron.

A SUGARCANE CUTTER.

The cane is cut close to the ground with a machete, the cutter developing an extraordinary skill which enables him to sever the cane, trim off the dry leaves, cut the stalk into suitable lengths, and throw the pieces onto a nearby pile, all in one almost continuous motion.

Photograph by C. R. Cameron.

TRANSPORTING SUGARCANE.

With a mule supplying the motive power, this apparatus, known as a *romana*, operates somewhat on the principle of a hayfork, hoisting cane from the carts, weighing it, and transferring the load to railway cars.

Sagua la Grande, on the north coast, is reached by railway through the rich central plain with smoking sugar centrals on every side. The city is situated 11 miles from its port of Isabela, with which it is connected by rail and also by road, as well as by the Sagua River. The latter is listed in the geographies of Cuba as the second navigable river of Cuba, since it offers passage to 7-foot launches for the 12 miles of its course between Sagua and Isabela. The longest navigable river of the island is the Cauto in Oriente Province, which small steamers ply for 50 miles. Isabela is built on a sand-spit and is growing out over swamps and beaches, the house being erected on piles in the water and the streets and lots gradually filled in later with sand and dirt. It was almost destroyed by the hurricane of 1932, but in compensation the same hurricane stranded a lumber ship nearby which had to be lightened by throwing overboard quantities of pine boards; these drifted ashore and enabled the inhabitants to rebuild their town. This little city rejoices in the possession of three names: Isabela, used on maps and Government publications; Concha, the name of the railway station located in the very center of the town and used on railway timetables; and General Pedraza, applied to the port, i. e., the water front. The port, made up of wharves, warehouses, and molasses tanks, accommodates vessels of 17-foot draft, the exports being sugar and molasses.

About two and one-half miles inland from Isabela, where the mangrove swamp joins the coastal plain, a plant has been established for the production of salt by the solar evaporation of sea-water.

A PATIO IN CAMAGÜEY.

This attractive hotel garden contains many specimens of Cuban flora.

As the water increases its percentage of salt, it is pumped from one bed into another, and when it begins to crystallize, it is removed to platforms with hoes, dried, bagged, and sold as *sal grano*. The plant is handicapped on account of the heavy rainfall, which averages 53 inches per annum.

Caibarién, another important port 58 miles by rail east of Sagua, is famous as one of the wealthiest small towns on the island, but its wharves have only shallow water, and the port for sea-going vessels is on a key 15 miles to the northeast, the cargo being handled by lighters. From Caibarién to Santa Clara the traveler passes through a tobacco-producing territory, the variety being known to the trade as *Remedios*, from the name of a near-by city. Almost every house along the automobile road from Camajuani to Santa Clara has a few acres of tobacco. At this season (February) the larger leaves were being cut and hung to wilt on poles staked up a few feet above the ground, later being removed to the barns to continue drying.

The city of Santa Clara, the capital of the Province of the same name, is near the geographic center of the Republic and beautifully situated 367 feet above sea level, encircled by weathered and rounded hills of coral rock. Its attractive central park, faced by hotels and

public buildings, was flaming with scarlet bougainvillea. On an eminence in a southern suburb is a handsome new structure, the Palace of Justice, erected for the use of the courts. This city marks the eastern terminus of the United Railways and the western terminus of the Consolidated Railroads, the two systems dividing between them almost all the public-service railroads of Cuba.

Camagüey, the capital of the Province of the same name, lies 168 miles east of Santa Clara and is connected with the latter by the main lines of both railroad and highway. In eastern Santa Clara cattle ranges begin to appear and the rolling country, which also extends over western Camagüey, seems ideal for grazing. Camagüey, indeed, is the cattle Province par excellence, having about one-third of all the cattle in Cuba, but it is also notable for its sugar, producing almost 30 per cent of the total sugar output of Cuba. The capital has 150,000 inhabitants and is a historic city of ancient churches

ROYAL PALMS.

Royal palms characterize the Cuban landscape, especially along the water courses, and satisfy many needs of the Cuban farmer. The leaves furnish thatch for the houses and shade for tobacco; their long petioles, which clasp the trunks, serve as siding for the houses and wrapping for tobacco bales; the blooms are the source of excellent honey; the oily nuts fatten swine; the wiry, finely divided raceme, stripped of its fruit, is used as a broom; the trunk is made into boards and posts; and the bud is good human food.

Photograph by C. R. Cameron.

and traditions of pirate raids and services rendered in the cause of *Cuba Libre* during the long wars of independence.

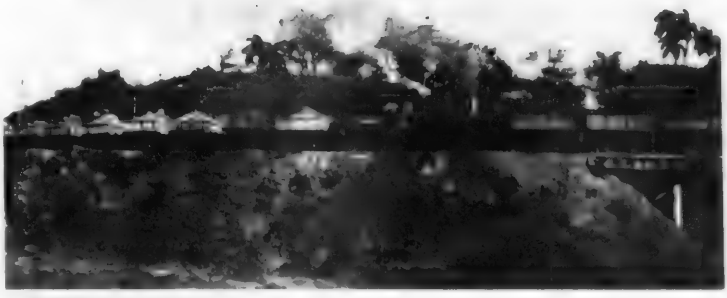
At Nuevitas, another important northern coast port 45 miles from Camagüey, the ships of Columbus anchored in 1492; it is reached by train over a branch of the Consolidated Railroads. On the north side of the railroad the traveler sees heaps of freshly dug earth, indicating the locations where chrome ore is being mined and shipped, this being at present the most important mineral production of the Province. Nuevitas itself, with about 5,000 inhabitants, has little commerce, but is made important by reason of its three sub-ports. One of the latter, Tarafa, opposite Nuevitas on the same peninsula, takes its name from the principal promoter of the Cuban Northern Railways, an important pioneer line (now absorbed by the Consolidated Railroads) extending through the coastal area from Santa Clara to this port, tapping a rich sugar area. All the public-service railroads in Cuba are losing money, but those in eastern Cuba are better situated than those in the west, since the former serve the greater distances of the eastern Provinces where the sugar crop is larger, the hauls are longer, and the competition of highways is less severe.

Proceeding eastward on the main line of the railroad from Camagüey, one sees fairly level land with a few detached hills until, having reached western Oriente, mountains appear on the southern horizon a little beyond Victoria de las Tunas and thenceforward are never out of sight. Cattle and sugar characterize this portion of Cuba, and near Alto Cedro an impressive landscape opens up. To the south, the fertile upper valley of the Cauto River, flowing westward toward

Photograph by C. R. Cameron.

BUS STATION AT HOLGUÍN, ORIENTE PROVINCE.

Half a dozen bus lines ply the Central Highway from Santiago to Habana and to Pinar del Río, making the trip in from 16 to 20 hours.



Photograph by C. R. Cameron.

HAULING MANGANESE ORE IN CUBA.

At the concentration plant at Cristo, near Santiago, use of the flotation process greatly raises the percentage of manganese concentrates obtained from low grade ore.

Manzanillo, is covered at this season with the rich yellow of the ripening sugar cane, which stretches away as far as the eye can reach, while to the north a scarcely less impressive vista of cane extends toward Antilla and Nipe Bay.

From Alto Cedro, 320 feet above sea level, a branch line of the railroad runs to Antilla, the main line here turning south toward Santiago, 47 miles away. The terrain now becomes rougher and the railway climbs through the valleys, but at San Luis, where the Guantánamo railway branches off to the east, is another rich sugar plain. Soon, however, the line reaches the summit and begins to descend to Santiago through a valley of luxuriant vegetation notably more tropical than that of the central plains. The chilly northern winds of winter at times sweep the plain, 300 feet above sea level, which the railway has traversed with little variation in altitude all the way from Camagüey, but they obviously do not reach this southern slope.

Santiago de Cuba, once the capital of the island, is a most interesting city, both economically and politically. The capital of Oriente Province, it is beautifully situated on rapidly rising ground at the head of a splendid bay, with precipitous, though not high, mountains in the background which geologists assert are very recent. It has about 140,000 inhabitants in the center, and is a modern city, now making a strenuous effort to extend and improve its public services. This, the site of distilleries of famous brands of Cuban rum and of

numerous other factories, railway shops, et cetera, has a numerous and influential proletariat.

With the history of Santiago de Cuba, founded in 1514, are interwoven the names of Diego de Velásquez, Father de las Casas, Hernán Cortez, Hernando de Soto, Adelina Patti,[1] and many others familiar to the readers of American history. Sixteen miles east of the city, at Siboney Beach, United States forces landed in 1898, and in the advance on Santiago participated in memorable actions at El Caney and San Juan Hill, the latter only two miles east of the city. The last-named hill is now crowned by a beautiful park, which has preserved the original trenches and is adorned with cannon, flowers, and shrubbery, offering a vantage point where one may enjoy a splendid view of the battlefields.

The port has an extensive import and export commerce, is the terminus of the main line of the Consolidated Railroads as well as of the Central Highway, and has daily airplane connection with Habana and intermediate cities. Oriente Province ranks first in area and population among all the Provinces of Cuba, surpassing in the production of sugar, coffee, bananas, and dairy products. Manganese is mined at Cristo, 14 miles north of Santiago de Cuba. This development is of interest to metallurgists as the first commercially successful application of the flotation process to the concentration of low-grade manganese ores.

The rail route from Santiago to Antilla lies through Alto Cedro and from the latter point traverses a level country covered with vast plantations of sugar cane. The city of Antilla itself, situated on a promontory jutting from the north into Nipe Bay, is approached by rail over a causeway built across a shallow arm of the sea. It has a population of about 5,000 people, and is important because of its sub-ports, exporting sugar, molasses, and some lumber, and importing edibles, jute bags, and machinery for the great sugar centrals and mining properties located around the bay.

A visit was made to a central which has 58,000 acres under cane, 180 miles of standard gauge railway, and 10,000 laborers engaged in the *zafra* (sugar harvest) in progress at the time. At least 25,000 people are dependent upon this central which, with three enormous tandem mills placed side by side, produces a veritable river of cane juice which in a few hours completes the circuit of filters, evaporators, and centrifugals, and forms another river of white sugar about 8,000 bags each 24 hours. This central has, besides the usual high-wheeled oxcarts for transporting cane from the field to the railroad, numerous trucks equipped with caterpillars in place of wheels, hauled by oxen and particularly valuable in wet weather. This central has built many houses for its laborers, provided an excellent hospital,

[1] Patti is said to have made her debut at Santiago de Cuba. EDITOR.

and almost entirely exterminated malaria among its resident population.

The return trip from Antilla to Santiago was made by airplane, affording an opportunity to appreciate from the air the beauties of Nipe Bay and the surrounding country covered with sugar cane, as well as the forest of pines (*Pinus cubensis*) on the mountains just south which furnish logs to the saw mills of Antilla. From Santiago to Manzanillo the journey was made over the Central Highway which here runs far south of the railway, at first through the foothills of the Sierra Maestra range, then drawing away from the mountains and traversing a splendid sugar and cattle country to Bayamo. The latter, a city of 18,000 people, is the most important dairy

Photograph by C. R. Cameron.

CENTRAL PLAZA OF MANZANILLO.

The port of southwestern Oriente Province lies 112 miles west of Santiago.

center of Cuba, having well-known cheese factories and milk-canning establishments. The milk is said to be of excellent quality and some is brought by truck over the Central Highway from points more than 100 miles distant.

Oriente Province has always been noted for its spirit of independence, and the route from Santiago to Manzanillo is historic ground. At Yara, 10 miles east of Manzanillo, was begun on October 10, 1868, the bloody and devastating Ten Years' War, during which Cuban independence was proclaimed, the first Cuban national flag used, and a constitution abolishing slavery adopted. At Baire, 22 miles east of Bayamo, on February 24, 1895, was begun the last Cuban rebellion which ended with independence in 1898.

Manzanillo is situated partly on a shelving promontory of coral rock, and partly on the narrow coastal plain. Its commerce, like that of all the other ports visited, is largely dependent upon sugar and molasses for exports, and for imports upon food-stuffs, machinery, and general supplies.

Between Manzanillo and Bayamo the traveler may go by rail or by road, the latter used mostly in the dry season. From Bayamo the journey was continued northward over the Central Highway, traversing the Cauto River plain and cattle country, to the rich agricultural center of Holguín, one of the most populous municipalities of the island. Near the city is located one of the most famous

Photograph by C. R. Cameron.

REMAINS OF A BLOCKHOUSE NEAR CIEGO DE ÁVILA.

During the last War for Independence concrete blockhouses or "fortines" were erected by the Spaniards in a 40-mile line across the narrow neck of the island in a vain effort to prevent the revolutionists from passing from one end of the island to the other.

gold quartz mines of Cuba (Aguas Claras). The return journey was broken at Ciego de Ávila, where in the last revolutionary struggle the Spaniards constructed a famous *trocha*, a line of block-houses (*fortines*) one kilometer apart, across the island to interrupt the communications of the revolutionists. Numbers of these crumbling concrete *fortines* are visible from the road, and a few miles to the north one passes a monument marking the spot where General Antonio Maceo broke through the *trocha* on November 29, 1895, during the famous "invasion" when the revolutionary troops marched in 90 days from Mangos de Baraguá, in eastern Oriente, to Mantua on the western coast of Pinar del Río.

At Ceballos, eight miles north of Ciego, there are considerable plantations of oranges and tangerines, which put on the market annually about 40 million citrus fruits. The varieties of fruit are so distributed as to provide a continuous production throughout the year. In this control of maturing seasons the planters are greatly assisted by irrigation, which enables them to hasten or, by withholding the water, to retard the crops. For this purpose, water is pumped from wells driven 60 or 70 feet in depth, tapping an apparently inexhaustible supply. It was very dry at the time of this visit, and all the wells were being pumped, one having delivered

Photograph by C. R. Cameron.

CUBAN TOBACCO.

Tobacco of the famous Remedios section is shown hung up on poles in the field to wilt prior to being taken to the barns for drying.

2,700 gallons per minute during 17 hours a day for several days without sign of a failing supply.

To cross Cuba from Habana to Batabanó makes an interesting trip. The latter port, on the Caribbean, lies 36 miles away, almost due south of the capital. The road, in fair condition, passes through great groves of royal palms and rolling hinterland, giving an excellent idea of the Cuban landscape. As one crosses the summit and proceeds down the gentle southern slope, the land becomes more fertile and the country is well cultivated with great plantations of sugar cane, corn, yuca (cassava), pineapples, and malanga (arum), with groves of bananas, mangos, and coconuts. Batabanó, together with its port, called Surgidero, about a mile from the city, has a population of three or four thousand people. From Surgidero

steamers maintain a regular tri-weekly service with the Isle of Pines, but sponging is the principal industry, and at times many scores of small sloops, which make up the sponging fleet, gather in the almost unprotected bay. Sponges are fished by grapples, each small boat sent out from the sloops having a crew of two, one to row and the other with a water-glass to examine the bottom. When the latter sees a sponge, he seizes it with the grapple, fixed on a pole 25 or 30 feet long. The sponges when gathered are taken to the mother sloop, constructed with a large open tank in the center in which the sponges are kept until, as the fishermen say, they "die." To the unsophisticated, however, it would appear that they are left to decay until the pulp around the sponge fibre is sufficiently soft to permit its being washed out, this process producing an odor which is not easily forgotten. The sponges are then washed and cleaned and strung up on ropes to the mainmast so that the sloop which has made a good catch is often seen festooned with long streamers of sponges.

Westward from Habana along the Central Highway toward Pinar del Río, 109 miles distant, the route leads through the beautiful suburban residential section of Habana, where in the month of June the flamboyant trees are covered with their vermilion blossoms, making a striking feature of the landscape. Notwithstanding its brilliance during the flowering season, the beauty of its fern-like foliage during the remainder of the year, and the gnarled stateliness of the older specimens, this tree seems to be planted sparingly. The highway makes many turns, and is bordered by laurel trees and Australian pines (*Casuarina equisetifolia*). In the great level area stretching from Rincón, south of the highway, to Artemisa is produced a high grade of tobacco, known as *Partidos*, which has a large light-colored leaf of fine texture, prized as a wrapper for cigars.

Artemisa is the center of pineapple cultivation and great fields of this fruit appear. Near Candelaria is a pineapple canning factory where a multitude of girls in white caps and aprons, with rubber gloves, trim and cut up the fruit, which is packed in 6-pound cans for use almost exclusively in the United States for confections, soda fountains, et cetera.

Beyond San Cristóbal the road runs closer to the Órganos Mountains or rather the mountains, projecting to the south, approach the highway, and from this point as far as Pinar del Río the countryside is dotted with great tobacco barns. First comes the zone of *Semi Vuelta*, whose aroma is not quite as perfect as that of the *Vuelta Abajo* tobacco. The landscape, now rolling and dotted with cultivated fields and groves, affords beautiful vistas, the royal and palmetto palms being mixed with various varieties of bottle palms. About

four miles before Pinar del Río is reached, the new army barracks are a conspicuous feature on the south side of the road.

Pinar del Río itself, a city of about 20,000 people on a gentle slope which stretches away 20 miles southwest to the Caribbean, is the center of the most famous tobacco-producing area in the world. Here is grown the *Vuelta Abajo*, from which are manufactured cigars unequalled for aroma and flavor. The district producing this choice tobacco extends only about 10 miles from north to south and 30 miles from east to west, the city of Pinar del Río being at about the center. Even here, the very choicest product comes from small *vegas*, or tobacco fields, a few acres in extent scattered here and there.

VIÑALES VALLEY.

Famed for its picturesqueness is the Viñales Valley in the Province of Pinar del Río.

Just east of the city the road to Viñales, 17 miles away, branches off the Central Highway. It is now being repaired and crosses first the alluvial valley of the Paso Viejo River and then gently rises through the foothills of the Órganos Mountains. Great thickets of guava trees, now covered with blossoms and small fruit, grow on either side of the road on what seems to be public land and from time to time marañón, or cashew, trees (*Anacardium occidentale*) are seen, laden with yellowing fruit. Tobacco occasionally appears, but there are also scattering plantations of corn and yuca, while to the south open up attractive vistas of the Caribbean plain along the northern margin of which runs the Central Highway.

The first glimpse of the far-famed Viñales Valley itself was obtained at mile 16 from Pinar del Río, where the road reaches the rim of the depression. The abruptness of this first view adds to the impressiveness of the valley, here two or three miles wide, apparently the work of a stream which in geological ages wrought strange shapes on the basin's rocky margins. From the floor rise various *mogotes*, or islands of rock, the stream having washed away the foundations and induced successive landslides, or rather, rockslides, leaving the sharp escarpments. The towering, broken wall on the far side of the valley, of hard, blue Paleozoic limestone, likewise weathered and worn into bold, sometimes overhanging, cliffs, is full of caves and ravines. Near the center of the basin nestles the thriving village of Viñales, for the region is famous, not only for its scenery, but for its fruit and tobacco.

With the visit to the unique Viñales Valley, this story of travel comes to an end. The sketch is fragmentary and can give the reader but a poor idea of the island so well named "Pearl of the Antilles." One can sympathize with Columbus, who wrote of Cuba in 1492: "This is the fairest land which human eyes have ever seen." But the modern has one advantage over the discoverer, and perhaps where words have failed, the photographs may be of assistance.

AIRMINDED HONDURAS

By Frans Blom

Director, Department of Middle American Research, The Tulane University of Louisiana

INDIANS labored slowly up over the mountain trails, panting under their burdens of more than a hundred pounds. Day after day they trotted and climbed, and at last came to the high valley, among wild mountains where now lies Tegucigalpa, the capital of the Republic of Honduras.

From the north coast they had first passed through the humid and tropical lowlands, through corn fields and plantations of cacao. The corn was their food and the cacao bean was money, so precious that only the rich could permit themselves to roast the bean and use it as a delicious drink.

These Indian carriers were weighed down under their burdens of corn, tobacco, and salt brought by traders who came in dugout canoes, from the distant salt-pans of northern Yucatan, two to three weeks distant from the north coast. Or they carried cargoes of obsidian, the volcanic glass that all their people used for knives.

Then the caravan reached the mountains and arid valleys. Through scorching sun they labored upward and upward, starting before dawn and not resting until they camped by a cool mountain stream in the evening.

This was before the white sails of Spanish ships first were sighted.

Then came the Spaniard, and he brought horses and mules. Fierce was the fight. Two cultures clashed and after the battle they merged.

The roads were the same, and the forbidding mountain barriers did not change. The innovation was the pack-horse and mule. New cargoes were added because the Spaniards searched for gold and silver, and there was much precious metal in Honduras.

So for some centuries in addition to the Indian carriers, there were to be seen on the roads long strings of pack animals, loaded down with ore or sacks and bags of the little beans from the bush—coffee—introduced by the newcomers.

The strange weed, that was so pleasant and billowed out in clouds of smoke from the mouth, became a favorite among the foreigners and they shipped great loads of it home to their country beyond the ocean, Ultra Mar. But the new means of transport did not speed up traveling, though it doubled the cargo per unit of carrier. The mule would carry 200 pounds against the 100 pounds carried by the Indian.

THE MAIN "TACA" OFFICE IN HONDURAS.

The airport of the capital, Tegucigalpa, is just outside the city at Toncontin. Note the map on the rear wall showing the extensive network of air lines and 76 landing fields.

Then a couple of centuries passed and strange things began to happen. First came long serpents of steel, carrying snorting animals that pulled huge boxes. Locomotives pulled merchandise to the mountains' edge, and on their return gathered up the luscious bunches of golden fruits, bananas. But still the mountains were too fierce and the "iron horses" stopped at their foot.

Next came another ground animal, lighter and swifter, but stinking—the automobile—and broad roads began to climb the mountains in tortuous convolutions. From the railhead in the tropics, through luxurious and rank vegetation, the road climbed up through rich valleys where orchids hang in incredibly splendid clusters overhead. Through pine-clad hills and into dust-parched valleys, the road reached Comayagua, Tegucigalpa, and continued to the Pacific coast.

Now traveling was faster, and greater loads could be carried. And with this more rapid transportation came new objects and new ideas.

Then one day a huge strange bird zoomed over Tegucigalpa and came to rest on a field outside the city. What was this? What did it mean?

Everyone in Honduras realized that it would cost untold millions to construct rail and automobile roads through the endless valleys and over the mighty mountains of the country. It was impossible, and as the riches of the country—such as the mines and the agricultural valleys, the timberland and the tropics—lay between huge barriers of rock, it was out of the question to finance such stupendous undertakings.

Now came the bird that passed through space, light and powerful, being stopped by neither mountain nor torrential river. And Honduras realized its value; the government from the outset gave its support to those who would develop air transportation; it became airminded.

The start was stumbling, erratic, and unfortunately showed many fatalities. Some of the first organizers were more enthusiastic than careful. But such conditions are past now.

And right here credit should be given to Lowell Yerex. It was he who built up the TACA (Transportes Aéreas Centro-Americanas) to the efficient and well-functioning organization it is today, and we feel sure that he will agree with us that he would not have been so successful if the government of Honduras had not given him its fullest support and confidence and if the people of Honduras had not "taken to the water like ducks"—pardon me, I should have said: "taken to the air like birds." Honduras became airminded very quickly. Let us see what is happening today.

The Republic of Honduras covers a territory about as large as the State of Ohio, but we must discount about one third, a vast area of practically unexplored country. Unknown for all practical purposes as yet, that is, though I am confident that the airplane is going to be one of the principal factors in opening up those wild mountains and valleys.

Today everything and everybody takes to the air. Let us spend a while at the Toncontín airport, at the edge of the capital, Tegucigalpa.

On a large plateau stretches the field, so large that the super-modern Douglas planes of the Pan-American Airways come and go without trouble, settle down to unload and load for a few minutes on their long flight down the continent. All around are mountains, and not far away rise the twin towers of the powerful government radio station.

But near the huge long-distance birds cluster smaller birds of lesser power. Those are the TACA flock, 13 or 14 ships of all shapes, sizes and makes. It has to be this way, because the 76 landing fields in Honduras are of all shapes and sizes, like the cargoes that must be flown.

There lands a ship from Choluteca with 600 pounds of milk and butter for the capital. The morning milkwagon. Over there a ship is leaving with machinery for a silver mine that is opening. A party of visitors are taking off for the incredibly spectacular Maya ruins at Copán, where the Carnegie Institution of Washington is cooperating with the government of Honduras in works of excavation and restoration. It is only a two-hour trip, and the government has built a landing field, right next to the ruins, large enough to receive a trimotored plane. It used to be a five-day ride.

The TACA will handle the traffic. Dr. Brosius, out among the mountains at Minas de Oro, ships in milk, cream, and, in season, strawberries, too. Waiter, please bring the sugar!

Here goes an hacendado. He has been visiting the capital and now is returning home. TACA will land him within a few hours' mule-ride from his house, and he will save days of tiresome traveling plus the annoyance and cost of transporting mama, the five children, and two or three servants, plus not only the bags but also those innumerable bundles and card-board boxes, containing presents from friends, that always follow along.

At the airport we meet the Hon. Julius Lay, the American Minister, who came in to close his house before his transfer to Montevideo, and in the center of a large group we see His Excellency, the Minister of Public Instruction, Jesús María Rodríguez, on his way to San Pedro Sula. He is traveling in one of the fast government planes piloted by a crack Honduran flyer.

THE TONCONTÍN AIRPORT, TEGUCIGALPA.

Regularly scheduled flights total more than 80,000 air miles monthly with 1,200 passengers and 260,000 pounds of freight carried. Upper: A general view of the airport. The operating office is at the right and a hangar in left background. Lower: Passengers boarding plane.

PRIMITIVE TRANSPORTATION IN HONDURAS.

While the Republic has become decidedly airminded, earlier means of transportation still have their use. Upper: An ox cart. Lower: A mule pack-train loaded with $96,000 in silver bars.

People fly in Honduras. The little brown-eyed maid of the hacendado takes it just as naturally as the President, Don Tiburcio Carías, and his private secretary, Don Carlos Izaguirre.

But it is not only the people, from the highest official to the little fellow, that fly in Honduras. It is every merchandise that can be flown.

While I chatted with the pilots I heard of strange cargoes, ranging from mining machinery, tobacco, hides, and salt to parrots, fighting-cocks, and monkeys. Butter-and-egg planes are usual, and sometimes that great orchid hunter, James B. Edwards, ships strange and exotic plants to the Arnold Arboretum at Harvard. They even ship archaeologists and land them in distant places from where they continue on foot or mule in their search for mysterious Maya cities.

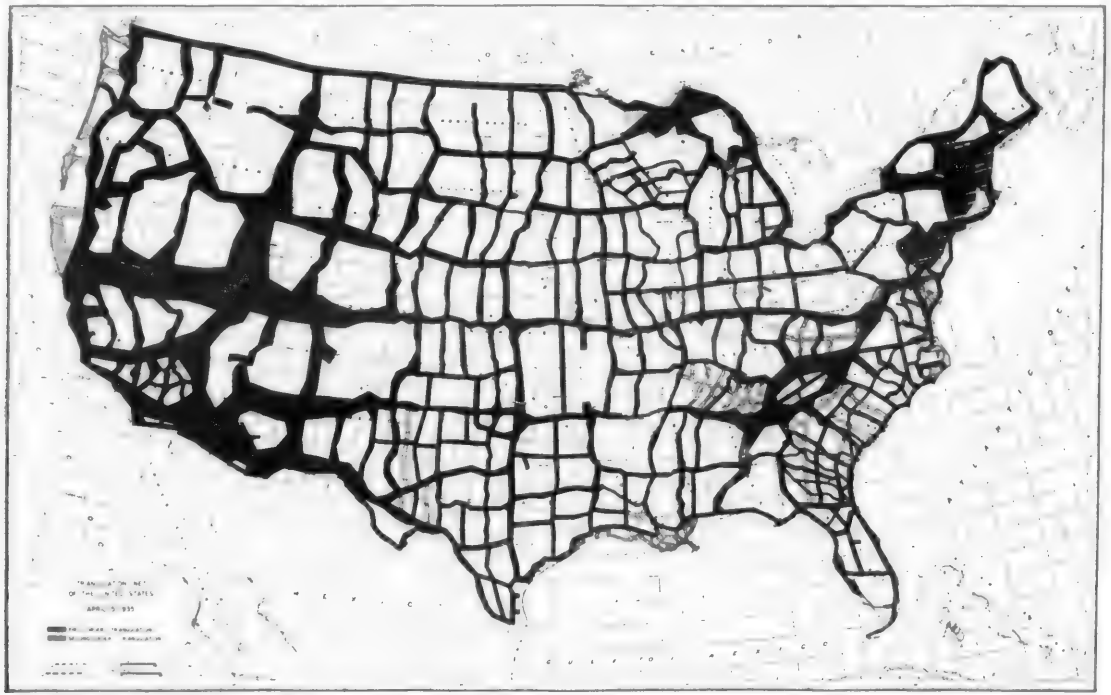
There are about 100 people employed in connection with the TACA; and 80 percent are Hondurans. They use 76 landing fields, nearly all constructed within the last four years. There are 42 scheduled flights per week with a total of more than 80,000 air miles per month, carrying about 1200 passengers and 200,000 pounds of freight. Ninety percent of the flights are completed in spite of much blind flying over the mountains—and this includes the rainy season that begins in September and goes right through with its torrential downpours to February.

We must not forget the north coast, the country where the banana rules. Formerly the mountains were such a formidable barrier that the fruit companies imported their rice, eggs, vegetables, and other perishable commodities from the United States. Not far away, but behind the mountains, lies the rich Catacamas valley, where vegetables can be grown without fear of tropical insect pests.

Thanks to air transportation, that rich but isolated valley now is delivering fresh vegetables, eggs, chickens, etc., to the north coast daily. And the vegetables are fresh because there is only a few hours' flying-distance between the field and the market. Rice comes cheaper by air from the Pacific coast than by boat from the distant United States of America.

Even the old smoking-weed has taken to the air. Copán tobacco, long famous, and expensive because of transportation cost, has gone "sky high", not as to price but as to the way it reaches the coast.

Every day something more is going to move above the mountains of Honduras. As you fly high up above, you see below the ancient trails where the men of Lempira, the great chief, used to walk. Many of their descendants are still walking down there, looking like small hardworking ants carrying great burdens. The iron horse is full of vigor and the gasoline pony is far from dead. But Honduras is airminded and will before long look down on that class of transportation, placing it among prehistoric things.



Courtesy of the U. S. Coast and Geodetic Survey.

TRIANGULATION NET OF THE UNITED STATES, APRIL 15, 1935.

The solid black portions designate first order triangulation, and the shaded portions second-order triangulation.

THE USE OF TRIANGULATION IN BOUNDARY SURVEYS

By William Bowie, C. E., Sc. D.

Chief of the Division of Geodesy, U. S. Coast and Geodetic Survey; Honorary President, Pan American Institute of Geography and History; President of the International Geodetic and Geophysical Union; and Chairman of the Division of Surveying and Mapping of the American Society of Civil Engineers.

THERE are many ways of surveying a boundary line between nations, between political subdivisions of a country or between two pieces of private land. Whatever method is used, it has been found by experience that the most satisfactory results are obtained if the surveys are based on triangulation.

Triangulation is a method of surveying based upon the mathematical principle that if the length of one side of a triangle and the angles of the triangle are known, the lengths of the other two sides can be computed. In actual practice, a triangle side called a base line is measured with great accuracy. The work is done with invar tapes or wires. Invar is an alloy of nickel and steel that has a very low coefficient of expansion, therefore the invar tape's changes in temperature during measurements have negligible effects. Of course the temperature of the tape is determined by thermometer readings, but the thermometer which gives the temperature of the air does not always indicate exactly the temperature of the tape; this difference is of no consequence when the invar alloy is used. A base line may be from 4 to 15 miles in length, depending upon the character of the country.

The highest points are used as the triangulation stations; they may be the tops of peaks, hills or ridges. Metal tablets are set in outcropping rock or in blocks of concrete to mark the stations. Theodolites, in principle like the surveyor's transit except that they are larger and very much more refined, are used for measuring the angles of the triangles formed by the monumented points on hills and ridges. The error in the measured angles of a triangle is seldom greater than one second of an arc. The two sides of an angle of one second diverge only 12 inches at a distance of 40 miles. This gives one an idea of the great accuracy with which angles are measured.

The lengths of the triangle sides or distances between the stations vary according to the character of the country. In flat, heavily wooded areas, the stations are from 5 to 10 miles apart, while in mountain areas the distance between contiguous stations may be 50

miles or more. What are generally called "chains of triangles" are carried across the country or along a boundary line. Observations are made on the boundary monuments from the triangulation stations in order to determine the latitude and longitude of the former.

By means of mathematical formulae the lengths of the sides of the triangles can be computed from the measured base for distances across country of 100 miles or more, when a new base must be measured to check the computed lengths of the triangle sides. In general, the computed and the measured lengths of the new base agree within one part in 25,000 of the length of the base, or at the rate of approximately 2 inches per mile. Adjustments are then made to distribute through the chain of triangles this difference of length in the base.

Triangulation necessarily has to depend upon astronomical observations for the determination of the latitude and longitude of a starting point and also the astronomical direction of one of the sides of a triangle. The astronomical observations can be made with great accuracy but they are referred to the plumb line or the direction of gravity and that is affected by the irregular surface of the earth. A mountain mass will deflect the plumb line towards it and a valley will deflect the plumb line away from it. In actual practice, many astronomical determinations of the latitude and longitude are made and an average position for one triangulation station is derived from all of the astronomical observations. For North America the initial triangulation station is called Meades Ranch, in central Kansas. Its astronomical latitude and longitude were derived from several hundred astronomical stations in the United States.

With the latitude and longitude of a station obtained from astronomical observations and the lengths of the bases and the angles of the triangles known, it is possible to compute the latitude and longitude of each of the triangulation stations. It is this information that is used in the determination of the positions on the earth's surface of the monuments of a boundary.

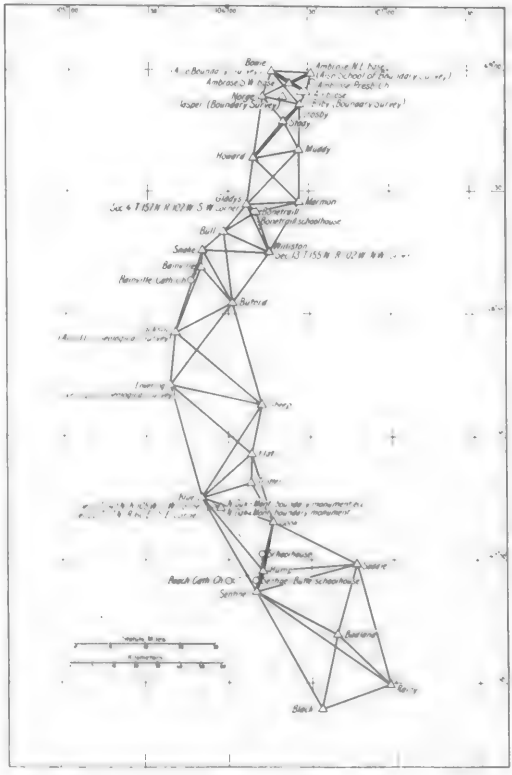
Each nation is vitally interested in its surveying and mapping operations. The ultimate object is to obtain a topographic map which represents a portion of the earth's surface and shows all data that may be essential to the efficient planning of the activities of mankind. The topographic map, in order to be most useful, must be accurate in position, distance, direction, elevation, slope and area. The geodetic or control surveys furnish the basis for the topographic map just as the steel framework of the modern office building is the basis for all the detailed parts of the structure.

For many years triangulation has been carried on in this country by the United States Coast and Geodetic Survey. A small amount of this class of work has been done by the Corps of Engineers of the United States Army, several river commissions, the Lake Survey and

the United States Geological Survey. The engineers of the Coast and Geodetic Survey are following a plan which calls for the spacing of the arcs of triangulation at intervals of approximately 25 miles over the whole country. At present there are approximately 65,000 miles of arcs of first and second order triangulation in the United States and at the present rate of progress it would be possible to complete the remaining 51,000 miles needed to finish the fundamental network of

ARC OF TRIANGULATION.

Showing connections with state boundary monuments and with stations of the Canada-United States boundary survey.



Courtesy of the U. S. Coast and Geodetic Survey.

arcs with the 25-mile spacing in less than three years. The stations, tens of thousands of them in number, of these triangulation arcs serve as the starting and ending points for detailed surveys. It is planned that within the 25-mile meshes of this triangulation net additional triangulation stations will be established with a spacing of from five to seven miles. Such a distribution of stations will be needed for the control of the topographic mapping and for many other engineering operations.

There is an arc of triangulation extending along the 49th parallel west of Lake of the Woods, along the boundary between Canada and the United States. This triangulation is connected directly with many of the boundary monuments and indirectly with other monuments near the boundary. There is also first-order triangulation through the Great Lakes and down the St. Lawrence River to the northern boundary of New York and thence eastward.

MONUMENT ON THE BOUNDARY BETWEEN THE UNITED STATES AND MEXICO.

Courtesy of the U. S. Coast and Geodetic Survey.

While there is no arc of triangulation directly along the boundary between the United States and Mexico, yet there is an arc very close to that boundary and a number of the monuments have been connected along that part of the boundary lying westward of the Río Grande. There is an arc of triangulation in Texas along the Río Grande or close to it, and therefore surveys to delineate the boundary between the two countries can be based on the triangulation stations of this arc.

Arcs of triangulation have been extended along certain parts of the boundary between the states of Texas and Oklahoma. There are other state boundaries near which triangulation has been done. In all cases where an arc of triangulation follows or crosses a state boundary, the longitude and latitude of one or more of the boundary monuments are determined. It is not known just what will be the future developments in the making of state boundary surveys, but it is probable that eventually the boundary monuments for all of the state lines will be connected with the national triangulation net. When this has been done there will never be any question as to the exact location of a boundary monument. If a monument were removed or destroyed, the geodetic engineer could reestablish within a few inches the point on the ground that was occupied by the center of the monument.

There have been controversies in several of our states over the positions of county boundaries. This difficulty could be avoided if county officials would agree on the boundary line and then have monuments along that line connected with triangulation. There is a growing demand for more accurate boundary surveys of public lands, such as forests and parks. There is also an increasing demand for more accurate determinations of the positions of monuments on the boundaries of private land. Much litigation could be avoided, and hence costs to political subdivisions of the nation and to individuals reduced, if boundary surveys could be more accurately and permanently located.

There will be little or no excuse for poor boundary surveys in this country after the triangulation has been completed. A great number of triangulation stations will be available that can be used as the starting points for such surveys. Even at present many boundary lines can easily be connected with the triangulation net.

Where there is an arc of triangulation along an international boundary, the maps of the two adjoining countries will show the topographic features lying on or near the boundary in exactly the same geographical position. Maps of adjoining countries showing different positions for topographic features, such as rivers, mountains, roads, trails, forests, houses, villages and other things, have led to misunderstandings. There is an old saying regarding farm lands: "Good fences make good neighbors." It is equally true that good boundary surveys make for friendship between peoples of two adjoining countries. Triangulation makes it possible to have good maps and undisputed boundaries.

THE GUATEMALA-HONDURAS BOUNDARY SURVEY

By Sidney H. Birdseye

Chief, Technical Commission for the Demarcation of the Boundary Line between Guatemala and Honduras

DURING colonial times the Spanish colony in Central America was known as the Kingdom[1] of Guatemala. This kingdom was divided into several provinces, each having a local governor who usually reported directly to the Captain General of the Kingdom of Guatemala. Apparently it was the intention of the Spanish Crown to have the judicial divisions of the colony correspond, more or less, to the various dioceses of the Church, but no precise limits were established for any of these judicial or ecclesiastical subdivisions. Many of the colonial documents and decrees of the Crown differed in their descriptions of the boundaries of the various subdivisions, but this was not considered a serious matter during Spanish rule, as the Crown owned everything in Central America and disputes regarding local administrative control were relatively unimportant to the King.

In 1821 the Kingdom of Guatemala declared its independence from Spain and formed the Federation of Central American States, which included the separate States of Guatemala, Honduras, El Salvador, Nicaragua, and Costa Rica. The boundaries of these state divisions of the Federation were to conform to the territorial limits of the original provincial divisions of the kingdom. Later, in 1838, the Federation was dissolved and the States became independent republics.

The development of the country prior to 1821 had been confined to isolated settlements and, as the majority of the country between them was practically an unexplored jungle, it was only natural that documentary descriptions of the provincial boundaries should have been vague and indefinite. As each Republic developed its natural resources in the years following independence, boundary disputes arose between the adjacent countries. Most of the territorial claims were based on old Spanish documents, both judicial and ecclesiastical, and the various interpretations thereof made the solution of these disputes very difficult.

The first attempt to settle the boundary dispute between Guatemala and Honduras, made in 1845, was unsuccessful. Several others were made at intervals but nothing definite was accomplished until the

[1] Also called Captaincy General, since it was governed by a Captain General.—Editor.

signing of the Treaty of Arbitration of July 16, 1930. This treaty authorized the formation of a neutral Boundary Tribunal with ample powers to make a definite settlement of the question, both Governments agreeing in advance to accept the tribunal's decision as final. The Special Boundary Tribunal consisted of the Hon. Chas. Evans Hughes, Chief Justice of the U. S. Supreme Court, as President, with Dr. Luis Castro Ureña of Costa Rica and Dr. Emilio Bello Codesido of Chile as arbitrators.

Such colonial maps of the disputed area as existed were conflicting and inaccurate. Later surveys made by both republics were confined to the southern section of the zone. The major part of the northern section was sparsely inhabited and practically unmapped. The tribunal, after careful study of the various claims and documents, found it necessary to prepare a reasonably accurate map of a large section of the area before it could reach a final decision. Owing to the very limited time available, it was decided to use aerial photographic methods in making the survey. The aerial survey of some 2,500 square miles of the disputed zone was ordered in July 1932, with delivery date of the maps set for December 31 of the same year. The U. S. State Department, Geological Survey and Army Air Corps cooperated in this survey by lending aerial and engineering equipment and providing trained personnel when necessary. The Army Air Corps assigned the taking of four-lens aerial photographs of the area in dispute to the 12th Photo Section at France Field, Colon, C. Z., and the work was done by Capt. Herbert K. Baisly, pilot, and Sgt. Barron C. Powers, photographer. The writer was placed in charge of the survey and field work, which was started in August 1932. Advance copies of the completed maps were delivered to the tribunal on December 23, 1932. These maps were drawn on a scale of 1:100,000 and show all drainage and most of the cultural details, also such topographic features as main water divides and prominent mountain peaks. The award was published by the tribunal on January 23, 1933, and the maps and aerial photographs were attached as an official part of it.

The boundary line, as established by this award, is approximately 260 kilometers (161 miles) long. In some sections the line follows water courses, in other sections it follows the natural water divides between river basins, and in still others the boundary consists of straight lines between prominent topographic features. The approximate distances for each of these subdivisions of the line are as follows:

	Kilometers	*Miles*
Water courses	60	37
Water divides	60	37
Straight line sections	140	87

Courtesy of the Technical Commission for the Demarcation of the Boundary Line between Guatemala and Honduras.

ENGINEERS' CAMP IN SOUTHERN SECTION.

Courtesy of the Technical Commission.

TOWER AND OBSERVING PLATFORM, ESKIMO TRIANGULATION STATION.

The majority of the southwestern 100 kilometers (62 miles) of the line passes through fairly well settled country, where numerous trails give direct access to the boundary. The northern 160 kilometers (100 miles) of the line run through thinly settled country, which is timbered with heavy tropical growth and is in many areas absolutely uninhabited. Trails in the majority of this section are few and poor and become impassable in the rainy season.

A supplemental Convention to the Treaty of 1930 authorized the formation of a Technical Commission for the demarcation of the boundary line. This commission is made up of five engineers, Lisandro Sandoval and Florencio Santiso representing the Republic of Guatemala, and José Padilla and Ramón López Recinos representing the Republic of Honduras, with the writer appointed as a neutral head by the President of the Tribunal. Each Government was authorized to appoint such auxiliary engineers as would be necessary for the field engineering work. The Technical Commission is charged with the identification of the controlling points of the boundary as described in the award; the surveying of the boundary line and the determination of the geographic coordinates of all of its important points; and the building of permanent monuments at all road, trail and river crossings and on all important summits along the line.

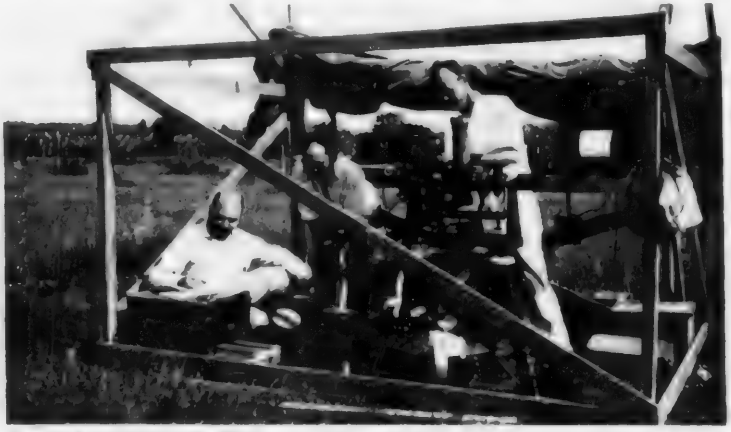
The field work of the commission has been going on since May 1933 and is now practically completed. The auxiliary personnel of the commission during its most active period consisted of 18 engineers and 2 doctors. It can be said without hesitation that the aerial photographs and maps from which the boundary line was selected and described have saved one or more years of field engineering work, in that each controlling angle point of the line could be quickly and accurately identified. In addition, the stereoscopic study of the aerial photographs in advance of the field work gave accurate information on the character of the terrain, thus permitting future work to be planned in detail. Then too, the line was described in such detail from the photographs and maps as to permit the field work to be carried on simultaneously in different sections, thereby reducing the total time required to complete it. The aerial photographs also permitted the accurate mapping of the frontier zone at a very nominal cost.

The program adopted by the Technical Commission in April 1933 divided the technical work into three main divisions: field engineering, monument building, and office work in calculations and drafting.

FIELD ENGINEERING

The field engineering work of the commission included a system of precise triangulation[2] throughout the entire boundary zone; the measurement of the entire boundary line with transit and stadia; the opening of a vista along the sections of the line that are not marked by water courses; the installation of tide and river gauges; and the running of some 70 kilometers (43 miles) of levels.

The reconnaissance for the triangulation was performed by the auxiliary engineers of the commission. This work started in November 1933 and required some 14 months to complete, owing to the character of the terrain, the heavy jungle growth in many sections, and the difficulties in transportation during the rainy season. This



Courtesy of the Technical Commission.

ESKIMO ASTRONOMIC STATION.

In the group are Ramón López R. and José A. Padilla, Honduran Commissioners, and Lt. J. P. Lushene of the U. S. Coast and Geodetic Survey.

season, lasting from June to December, made field work very arduous, in that clouds and fog settled on the mountain tops for days at a time and many of the mountain trails became impassable.

The observing work on precise triangulation is necessarily a specialists' job, requiring expert observers and expensive equipment. The Technical Commission was particularly fortunate in obtaining the cooperation of the U. S. Coast and Geodetic Survey. This organization lent all the special equipment necessary for night observing and astronomic work, detailing Lieut. Joseph P. Lushene, an expert geodetic and astronomic engineer, and Mr. Philip A. Welker, an expert geodetic engineer and computer, for the observing work.

[2] Cf. "The Use of Triangulation in Boundary Surveys" by William Bowie, pp. 694-699.

Observing started on January 20, 1935, and was completed in six months, including the establishment of two astronomic stations with La Place azimuths and the measurement of the southern base line. Two instrument parties were used on the observing, working simultaneously on the opposite sides of the string of quadrilaterals. This plan was adopted in order to complete all field work during the unusually short observing season common to these countries. Thirty precise stations were occupied, and some 33 secondary positions at close intervals along the actual boundary line were located by intersections from the main scheme stations. Very difficult field conditions were encountered throughout the work; at the majority of stations 10 or more days were required to complete the necessary observations, owing to bad weather.

Office calculations and the Least Square adjustments will not be completed until after this article has been published. However, the accuracy of the work is indicated by some of the field computations:

Triangle closures in 48 triangles:
- Average closure ..... 0.90 seconds
- Maximum closure ..... 2.73 do.

Southern base measurement:
- Probable error in measurement ..... 1 in 1,400,000
- Probable error in La Place azimuth ..... 0.23 seconds

Northern base measurement:
- Probable error in measurement ..... 1 in 640,000
- Probable error in La Place azimuth ..... 0.26 seconds

(Note.—This base will be remeasured in order to reduce the P. E. within limits for precise work, which is 1 in 1,000,000.)

Longitude determination:
- Probable error at northern base ..... 0.006 seconds
- Probable error at southern base ..... 0.002 do.

Latitude determination:

Precise latitude observations have been made at both bases in accordance with the Coast Survey standards. The computed results for the P. E. are not available at this date.

Two engineering parties were employed in the measurement of the boundary line during the short field season of three months in 1933, and four engineering parties during the past two full field seasons. The length of the field season for this class of work was usually from November to the following July. Two engineers, one from each country, were assigned to each transit party, and both participated equally in all of the technical work. Each engineer made a record of his own measurements and was required to compare results with his colleague before leaving any instrument station. Certain limits of error between the individual measurements were allowed for each class of measurements, and if the comparison of the results failed to come within these limits, the measurements in question were repeated by both engineers. The average of the two results was accepted as the final value of the measurement.

Straight line sections of the boundary were projected by double centering the forward station. The angle traverse along the stream courses and divides was run by double deflection observations at each transit station, with fore and back sight stadia readings for distance. Vertical angle elevations were carried throughout the work along the line. Solar observations were taken at certain intervals and the traverse azimuths were adjusted to the mean values of these observations. The transit traverse work was performed with Model 5076F Kueffel & Esser transits, reading to 30 seconds on the horizontal limb and to 1 minute on the vertical limb. The vertical arc was provided with a control bubble and circular bubbles were attached to each stadia rod, in order to reduce errors in stadia measurements due to the inclination of the rod. Stadia readings for distances up to 300 meters (984 feet) were permitted.

Each engineer was required to make a sketch of the topographic details along the line, form contours being used to indicate the features and direction of the drainage. These sketches were used to select the locations for the boundary monuments and to supplement the map data.

A vista of from 10 to 30 meters (33 to 99 feet) wide, depending on the character of the timber, was cut along the majority of the boundary, with the exception of those sections marked by water courses. Aerial photographs taken in 1935 show the value of this vista in marking the boundary line. However, the fast growing jungle will obliterate this vista in a few years' time, unless the two Governments arrange for the clearing of the line at regular intervals.

It was found necessary to suspend the field work of measuring the line during the worst of the rainy season, usually from July to November. In most of the southern section, field conditions were relatively easy because of the many trails and several large settlements within easy riding distance of the boundary. In the northern section serious transportation problems were encountered, due to the lack of trails and the roughness of the terrain. In many areas it was necessary to construct new trails and to pack all supplies and equipment into the line on the backs of the workmen. Progress data indicate that it required nine and a half days to open the vista and measure each kilometer of line.

MONUMENT BUILDING

Four different types of boundary monuments were adopted by the commission. Types 1, 2 and 3 are similar in form but vary in size. They are built of concrete, using a 1:2:4 mixture, with a half-inch round iron vertical reenforcement in the towers. Type 1 is 1.2 meters (3.9 feet) high (above ground) with base a meter (3.28 feet)

square and a foundation from three-quarters to one meter (2.46 to 3.28 feet) deep. Type 2 is 0.7 meters (2.3 feet) high, with the same base and foundation as above. Both of these types of monuments require an average of 500 pounds of cement per monument. Type 3 is a special monument approximately 3.6 meters (11.8 feet) high and is made in the same form as the above-mentioned ones, with correspondingly enlarged dimensions in the base and foundations. The fourth type of monument, consisting of a 20 cm (7.87 inch)

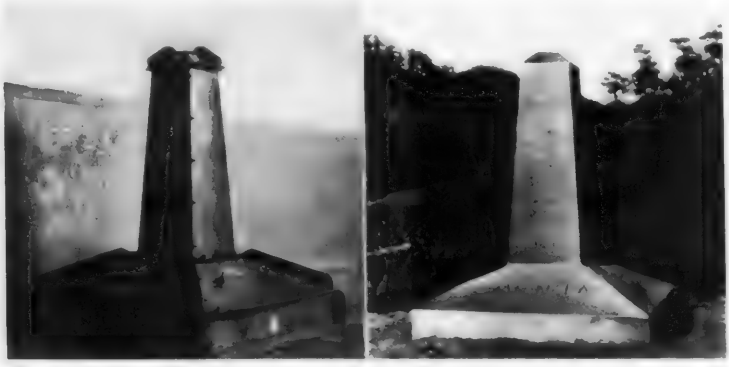
BOUNDARY VISTA ALONG A WATER DIVIDE.

Courtesy of the Technical Commission.

square pier set 0.5 meter (1.64 feet) in the ground and extending above the surface 15 cm (5.9 inches), is used in marking the minor points along the line. A 5 cm (1.96 inch) square topped bronze pin, with long shank imbedded in the concrete, is set in the top of each monument. A cross denoting the position of the station and the number of the monument is stamped on this bronze pin. Collapsible metal moulds of one-eighth-inch sheet iron were made for pouring the first two types of monument. These metal forms are bolted

together and, when taken apart, can be transported on mule or man back. Sections of the slanting sides of the base can be removed without disturbing the monument. Baffles on the inner side of these slanting sections leave an oblong hole in the concrete monument. After the monument has set sufficiently, these holes are filled with neat cement, and metal plaques with reverse lettering are used to stamp the names of the countries and other information into the monument.

Along the straight sections of the boundary, monuments were built on all important topographic features and at all trail and large stream crossings, irrespective of the distance between points. In the broken sections of the line following the water divides, monuments were constructed at nearly every transit station. The majority of



Courtesy of the Technical Commission.

BOUNDARY MONUMENT, TYPE NO. 1.

Left: The metal mold for the monument. Right: Completed monument, 3.9 feet high.

the stations along these water divides are marked with the type 4 monument, the larger monuments being located only on the higher peaks and at trail crossings. In the sections of the line which follow water courses, reference monuments were placed on the stream banks at trail crossings and at junctions of important streams.

The greatest difficulty encountered in monument building was the transportation of materials. Cement was delivered to the nearest railroad station and it required from one to three days to pack it by mules into the nearest settlement along the boundary, where it was temporarily stored until needed in construction work. Cement was furnished in 100-pound paper sacks with a jute covering sack, which prevented serious loss in pack transportation. In many instances it was necessary to pack sand, rock and water by mules or men for distances up to 10 kilometers (6.21 miles).

Monument building started in April 1934 and was continued until September of that year, when work was suspended on account of the heavy rains. Work was resumed again in 1934 and is still being carried on. On June 30, 1935, the commission had built 169 of the larger monuments and 629 of the smaller type 4 monuments, a total of 798. It is estimated that there are approximately 160 more to be built along the line and it is expected that all work of this class will be completed by next February.

DRAFTING AND CALCULATIONS

The Technical Commission proposes to publish a series of 1:25,000 scale maps of the region along the boundary line. These maps will be developed from the aerial photographs taken in 1932 and from the transit traverse work along the line. They will be laid out in quadrangles of 6 by 8 minutes of latitude and longitude and photolithographed in three colors. Thirteen of them will cover the entire boundary to an average distance of 10 kilometers on each side of the line. The maps will be controlled by the traverse and triangulation work of the commission and will be carefully compiled by radial line plotting. All drainage and cultural details will be shown in blue and black respectively, with the frontier line in red. Contours will not be used, but the elevations of important topographic features, as determined by vertical angle levels, will be printed on them. In addition, the 1:100,000 Award Maps, published in December 1932, will be recompiled on more accurate control data than were available during the hurried survey of that date. Auxiliary maps showing indexes, triangulation layout and monument positions will also be included.

CONCLUSION

The engineering work on this survey has been maintained at relatively high standards for several reasons. Both Governments are contemplating other international boundary surveys in the near future and the training their respective engineers are now receiving will be of great value in this work. It is also hoped that other nations will profit in their boundary settlements by the present example of amicable arbitration and high standards of demarcation. It is important to realize the value of aerial photographic mapping in such work. In the present survey the aerial photographs not only have proved their worth to the tribunal in its work of selecting and describing the boundary line, but also have been of great value during the field engineering work of demarcation.

Another important reason for high accuracy in the basic control work is that the present system of precise triangulation is the first work of this character in Central America. The arc of the present

system, extending as it does more than two-thirds of the distance from ocean to ocean, affords an ideal base for future extension of first order control into each Republic. Furthermore, it is hoped that at some time in the future this work can be connected with the precise net of triangulation in Mexico and that it also can be expanded southwards to Panama and Colombia, thus giving a common geographic datum to all Central America and the Isthmus.

A development of this nature in the present work has been the participation of the Republic of El Salvador in the determination of the common boundary point of this Republic with Guatemala and Honduras. A new aerial survey of the area in the vicinity of the

Courtesy of the Technical Commission.

FLOOD GAGE ON THE MOTAGUA RIVER.

common corner was made in January and February 1935. The U. S. Army Air Corps again cooperated in this survey by performing the aerial photographic work and detailing from the 12th Photo Section Capt. W. R. Taylor as pilot and Sgt. Geo. W. Edwards as photographer. A 1:25,000 scale map covering some 250 square miles was prepared by the Technical Commission from the aerial photographs and the engineering representatives of the three Republics were able to reach an accord on the position of the common corner with relative ease. The map afforded precise knowledge of the terrain and the outlines of the respective titles of land ownership were easily plotted on the map. Not only was the position of the common corner determined and accepted, but also some 11 kilometers (7 miles) of the boundary of El Salvador, part with Guatemala and part with Honduras, were accepted by the joint engineering commission, subject to ratification by the respective Governments.

In addition, the Republics of Guatemala and El Salvador have started negotiations for the adjustment of their common boundary line. In order to provide an accurate base map on which the boundary can be defined with justice to each country, these two Republics agreed to make an aerial survey map of the entire boundary zone, extending from the common corner with Honduras westward to the Pacific Ocean, a distance of approximately 130 kilometers (80 miles). This survey was made with the cooperation of the U. S. Army Air Corps at the same time as the above mentioned work in January and February 1935. It is proposed to extend adequate precise triangulation control from the present system along the Guatemala-Honduras boundary, and to compile the maps by the same method that is being used on the present work.

In conclusion, the writer wishes to thank the various departments of the United States Government for their excellent cooperation in the present work. He also wishes to thank the Governments of Guatemala, Honduras and El Salvador for their very willing assistance in solving the many problems, both technical and financial, encountered on this work. The personnel of the Technical Commission has been of the highest grade and the success of the entire work is due to the fine spirit of cooperation displayed between the engineers of the two Governments.

THE FIRST CHILEAN STUDENTS IN THE UNITED STATES (1815–19)[1]

By Dr. Eugenio Pereira Salas

Professor in the Pedagogical Institute, University of Chile

EACH age entrusts to education the task of producing the type of man it needs. In the early struggle for independence South America needed military men. The idea of liberty was already generally accepted, thanks to the intellectual foundations laid by the cultured champions of independence. The leaders had introduced these ideas to the people in general, imbuing them with an ardent patriotism. But the triumph of that cause still had to be accomplished on the battlefield. Hence the need for soldiers, that is, of military experts, leaders for whom strategy and the handling of troops should be a matter not of intuition but of science. South American eyes were, therefore, fixed on the great nations. After peace had been restored in Europe with the end of the Napoleonic era, many illustrious officers, attracted by the nobleness of the cause or impelled by a spirit of adventure, came to our shores. But it was also important for our men to go abroad so that, from the instruction there offered, they might gain the necessary knowledge.

The course of the revolution in Chile turned our national thought toward the United States. The vivid example of its recent struggles for liberty was an inspiration to our early writers; the work of Joel R. Poinsett raised the hope of possible American intervention on our behalf; and the sympathies awakened among us by the gallant figure of Capt. David Porter did the rest. Historical events facilitated the arrival of the first Chilean students in the United States; the circumstances were so novelesque that it is of interest to recall them.

On March 28, 1814, the inhabitants of Valparaíso watched from the hills the homeric combat off Punta Gruesa between the American frigate *Essex*, under the command of Captain Porter, and the English vessels *Cherub* and *Phoebe*, which had been lying in wait to avenge the American's exploits during his cruise in the Pacific. Seldom has there been a bloodier combat. The *Essex*, shattered and riddled by shot, had to raise the white flag after two hours of the tragic engagement.

[1] The sources of this study are for the most part unpublished. The following material was consulted. Regarding the Blanco brothers: Jeremy Robinson, "Diary"; Samuel Hill, "Log-Book of the Ophelia", New York Public Library. For Valdés y Carrera, Vicuña Mackenna, "El Ostracismo de los Carrera"; letter of Porter to Monroe, Jan. 3, 1819, Library of Congress. Referring to Edwards: Hill Papers, Yale University; Henry Hill, "Incidents in Chile"; and Miguel Munizaga, "Don Jorge Edwards."

The many wounded were transferred to land, where the women of Valparaíso cared for them with generous solicitude. The homes of some of the most prominent citizens were converted into improvised hospitals, among them that of a wealthy merchant, Don Remigio Blanco. He had distinguished himself during the first period of independence by his love for the United States, and because of this Joel R. Poinsett had appointed him vice-consul in Valparaíso.

Blanco's generosity made a great impression on the gallant sailor and, to reciprocate the hospitality and the affection for his country displayed by the distinguished Chilean, Captain Porter took Blanco's two sons, Mateo and Luis (then about 18 years old), with him as midshipmen to be educated in the United States.

Unfortunately the Military Academy at West Point was closed to foreigners, especially to individuals from that far-away other America whose national status was temporarily hybrid, the requirements of international law by which they could claim a country, a government, and a flag being still unfulfilled. (The battles of Chacabuco and Maipo were still in the future, and the Chileans had before them the cruel hours of reconquest.) But the valiant Porter refused to recognize any difficulties. Taking advantage of the current interest in our cause and the growing popular enthusiasm for it, he approached President Madison himself for the necessary permission. While the authorization was being secured, Luis and Mateo Blanco began their studies in the United States as students in the Yorktown School. In 1816 they were enrolled in the Military Academy at West Point; to them belongs the honor of being the first foreign students in that famous institution.

The Blanco brothers were not model pupils. They had been accustomed to the turbulent life of Chile in the struggle for independence, a rough free life full of daily excitement; far from home, with a scanty knowledge of the language, they could not adapt themselves to the strictness of the academic life of that period. Clashes were continuous and the school authorities even went so far as to complain to the President of the United States and ask that the boys be expelled. Through the influence of the President himself, they were kept as students simply because, according to a contemporary, they were South American patriots and at that time interest in Hispano-American affairs was intense.

Meanwhile, Don Remigio Blanco had been arrested in Chile after the battle of Rancagua, which delivered the country into the hands of the Spaniards, and as a penalty for his support of the patriotic cause and his friendship with North Americans he was exiled to the prison at Juan Fernández. Only the mother, Doña Petita Ramírez, was left to care for her sons' interests, and she scrupulously carried

out the arrangements made with Captain Porter. In spite of her feminine grumblings, she religiously sent the money for the tuition and maintenance of the two lads, a matter of some $600 a year.

The career of the Blancos at West Point was short and incomplete. In April 1818 we find them back in Chile in the employ of Lynch, Hill & Co. This firm —composed of Estanislao Lynch, a young man from Buenos Aires, and Henry Hill, a North American —included among its activities the equipping of privateers for the obstruction of Spanish maritime commerce. The boys remained in that office until Hill's return to the United States. The triumph of the liberating army in Peru drew them to that country, and all later trace of them has been lost.

The voyage of the Blanco brothers was not unique or isolated; their return to Chile coincided with the departure of another student whom the political fates transplanted to the then classic Land of Liberty.

In 1816 Gen. José M. Carrera, ex-President of Chile, had visited the United States for the purpose of obtaining stores and ships for a glorious but ill-starred expedition; there his bearing, his ability, and his personality aroused enthusiasm among the Americans. His patriotic proclamations had rallied to his cause various people attached to our country by bonds of affectionate gratitude. Conspicuous among these were former consul Poinsett and the magnificent Captain Porter, and even students at West Point offered to join the dangerous enterprise. The memory of Carrera has been perpetuated in the friendship of these men for him.

Some time later Commodore Saint Clair, commander of the frigate *Congress* which carried the commission charged with informing the Congress of the United States about conditions in the recently constituted South American nations met General Carrera in Montevideo where, a fugitive from Buenos Aires, he was persecuted like a wild animal by his implacable enemies. The Commodore, moved by the other's misfortunes, generously offered to take a nephew of the General's to the United States and educate him there. That was how Don Pedro Valdés y Carrera happened to be installed in Philadelphia, under the protection of Mr. John H. Mifflin, at the end of 1818. The young man was faced with the same difficulties that had arisen in connection with the Blanco brothers. But Captain Porter, as indefatigable as ever, once more gave proof of his affection for us and ours. In an eloquent letter[2] dated January 3, 1819, he asked the President of the United States to give Carrera's nephew the same opportunities that had been granted to the Blancos:

[2] Now in the Manuscript Division of the Library of Congress, Washington, D. C., with other Monroe correspondence. EDITOR

You have heard of that persecuted family of Chillian patriots the Carreras . . . Only one of the brothers now lives Joseph Miguel de Carrera the former President of Chilli who I once had the honor to present to you. . . .

A nephew of this gentleman has reached the United States—he is a youth remarkable for his intelligence.—

The calamities brought on that family by their enemies occasioned great alarms in their minds for the safety of the one most likely to succeed Joseph Miguel de Carrera in his honorable career; and from the interest which I have heretofore taken in the welfare of Chili, as well as from the claims which as an officer of the American Goverment they have on me for the hospitable reception given to my command while Carrera was President they consigned this youth to me "that he may (in the language of his mother) have sown on his tender mind, those seeds of honor, science, politics and war, that may render him the pride of his country, the dispenser of her justice or protector of her rights."

I enclose to you the letters which I have received from his uncle, his mother & his friends respecting this interesting youth; and take the liberty to suggest the vast political importance which may result from an education calculated to instill into his mind a knowledge of our institutions and the purest republican principles.— The experiment was made on two young men who came from Chilli with me— It did not succeed agreeably to my wishes, but they carried with them to their country the seeds of military science which may hereafter be useful— In this case there is the best hopes of success, and the same reasons which induced the former President to provide for them may be urged in favor of him.— The debt of gratitude is a National debt, and for the payment of which the nation will receive all the advantages.— May I beg therefore that the Nation will take on itself the responsibility of his education by admitting him as a cadet into the Military Academy at West-Point as the place most likely to effect the object of his visit to this country.

Valdés y Carrera did not enter West Point, but was allowed to enter the Navy for training (the Naval Academy at Annapolis had not yet been established). He remained several years in the Navy, where he won the commission of lieutenant.

In 1833, on leave in Chile, he went to the family estate at San Miguel. Commander Downes offered him a commission on the *Falmouth*, but the precarious state of his health obliged him to resign from the United States Navy. After he had recovered, he entered the Chilean Navy, where he rose to high rank.

The last of the Chilean students of that period went to the United States not for a military education, but for the commercial training and experience then so greatly needed if the economic resources of our land were to be developed. His visit was a result of the activities in Chile of the United States vice consul in Valparaíso. This was the Henry Hill to whom reference has already been made, and who had come to our shores as supercargo aboard the *Savage*, one of the vessels in Carrera's fleet. In Coquimbo, Hill had become a friend of Don Jorge Edwards, the founder of the large and distinguished Chilean family of that name. In a privately printed pamphlet of reminiscences

written nearly 70 years later, Hill said, "His oldest son, Joaquín, he [Don Jorge] intended to send to England for a mercantile education; but after we became acquainted he changed his mind and sent him to this country [the United States] in the *Savage*." The boy traveled under the care of Captain Perry, who delivered him to a friend of Hill's living outside New York. Joaquín Edwards began his studies in the local school and continued them in New Haven. "Afterwards", Hill wrote, "he was in my family in Boston, and in the counting-room of Baker & Hodges. From funds of Dr. Edwards, I paid those gentlemen at the rate of two hundred dollars a year for the privilege Joaquín had of being in their counting-room, which was one of the first of Boston."

After remaining eight years in the United States, Joaquín Edwards returned to La Serena with a thorough knowledge of business principles and practice and a perfect command of English. Among his many distinguished descendents are His Excellency Don Emilio Edwards Bello, the present Minister of Chile in Cuba, and the latter's brother Joaquín, the great Chilean writer.

Such were the distant origins of educational intercourse between Chile and the United States which, as years have passed, has proved to be one of the most adequate and effective means for the mutual understanding and reciprocal esteem of these two nations of our great America.[2]

[2] In 1933-34 the author held a Guggenheim fellowship in the United States for the study of early commercial relationships between this country and Chile.—EDITOR.

CAPT. DAVID PORTER.

THE BOLÍVAR ANNIVERSARY

THE 152nd anniversary of the birth of Simón Bolívar, the Liberator, was commemorated on July 24 by special ceremonies in Washington and New York.

The Minister of Panama, Dr. Ricardo J. Alfaro, the Minister of Bolivia, Dr. Enrique Finot, and the consular officers of the Bolivarian Republics in New York were the guests of honor at the luncheon given by the Pan American Society in that city. At the close of the luncheon the guests proceeded to the statue of Bolívar in Central Park, where they were joined by many members of the Latin American colony in the metropolis. It will be remembered that this statue was the gift of Venezuela to the City of New York.

Mr. John L. Merrill, president of the Pan American Society, presided at the ceremonies of homage to the great South American patriot, soldier, and statesman and made a brief address. The consul general of Colombia, Señor Don Gabriel Garcés, spoke on behalf of the Bolivarian consular corps, praising the ideals of Bolívar.

To the inspiring music of the national anthems of Venezuela, Colombia, Ecuador, Peru, Bolivia, Panama and the United States, played by the 18th United States Infantry Band, the flags of those countries were presented.

As a final tribute to the hero, wreaths were deposited at the foot of the statue by representatives of the Pan American Society, the Bolivarian Consuls General, the Colombian-American Chamber of Commerce, the Ecuadorean-American Association, the Peruvian-American Association, the Liga Internacional de Acción Bolivariana, and the Pan American Student League.

At 3:30 in the afternoon (E. S. T.) a special radio program was sent from Washington over the blue network of the National Broadcasting Company. The tributes to Bolívar, delivered by diplomatic representatives of the six nations liberated by the sword of this great hero, were rebroadcast by short wave from Station W2XAF in Schenectady. The addresses, in the order in which they were given, were as follows:

VENEZUELA

The name of Bolívar has become the symbol and standard of Pan Americanism through the justice and the gratitude of successive generations.

The Liberator, anticipating the march of time, perceived the future of America. He realized the fundamental unity of our Continent, both physically, on account of its geographical position, and ethically, because all the nations inhabiting it were then, as they are more strongly every day, moved by the sense of their own independence and respect for that of their neighbor.

Courtesy of the Pan American Society.

THE BOLÍVAR STATUE IN CENTRAL PARK, NEW YORK CITY.

The 152d anniversary of Bolivar's birth, July 24, was commemorated by ceremonies under the auspices of the Pan American Society of the United States.

On that foundation Bolívar based his doctrine of cooperation between American nations for their common defense and for the solution, by juridical procedure, of controversies which might arise among them.

There is no conflict between that ideal and the Monroe Doctrine. The latter is a unilateral statement of the obligation which the United States voluntarily assumed not to tolerate any attack against the independence of the American nations. But Bolívar's comprehensive doctrine has the same intent, and therefore the Monroe Doctrine can be merged with it, as in a single mighty river are merged the waters of its several tributaries.

I send greetings on this glorious day to the citizens of the entire continent.

PEDRO MANUEL ARCAYA,
Minister of Venezuela in the United States

PANAMA

The life of Bolívar was one of constant contrast. Perhaps in that fact lies the remarkable power of his greatness.

The life of the Liberator is full of those singular contradictions through which he was to realize his transcendental human achievement in spite of surroundings and circumstances. He was born an aristocrat and was a founder and champion of democracy. He was brought up in affluence and died almost in misery. The master and lord of slaves, he made the abolition of slavery the keynote of his policies. His career was crowned by the most brilliant success which the sword of a soldier could achieve, and yet his reverses outnumbered his victories. He was most to be feared in defeat; he was greatest in adversity; the triumph of his

arms was most evident in the tragic hours of Casacoima and Pativilca. He was a magnanimous man, yet his hand signed without trembling the terrible decree of war to the death. The demands of critical moments led him to imprison famous leaders when he believed the life of the Republic to be threatened, but he pardoned conspirators even after seeing his own life in jeopardy. In a moment of discouragement he was convinced that he had only ploughed the sea; but the seed which he sowed grew later into the robust tree from whose trunk sprang six vigorous free nations. At another time he believed he had failed, when he tried to convert into reality his beautiful dream of American federation, with his Corinth on the Isthmus of Panama; but in that apparent failure lay hidden the germ of continental solidarity and the most vital principles of the international commonwealth. He courted death on a hundred battlefields and bullets spared him. He resisted the rigors of fifteen years of campaigns, but succumbed before the deceits, the disillusionments, and the blows of human maliciousness.

When Bolívar closed the stupendous drama of his life at San Pedro Alejandrino, there appeared in history a figure of granite, shaped by a cyclopean chisel. His virtues, coupled with his defects; his achievements, together with his errors; his enormous successes, reached after crushing disasters; his dictatorial acts and his incomparable epic of emancipation: this whole aggregate of violent contrasts, of light and of shade, of horror and of glory, of destruction and of creation, of death and of life, is necessary to give the superhuman dimensions of the colossus: just as to appreciate the grandeur of a mountain one must start at its base, climb over its crags, shudder at its black abysses, follow paths along frightful precipices and abrupt cliffs, until one reaches the serene atmosphere of the summit which, silhouetted against the heavens and caressed by the sun, appears to the wondering eyes of mankind as an eternal symbol of glory and of might.

RICARDO J. ALFARO,
Minister of Panama in the United States.

COLOMBIA

I think we should all be thankful to the National Broadcasting Company for their happy thought of organizing this tribute of respect and admiration to one of the greatest men of modern times, for it enhances the possibilities of closer international cooperation through a better acquaintance with the men, facts and ideals that have constituted the foundation and development of the American Republics.

I believe that we all agree that a lasting and enjoyable cooperation cannot be based on material interests alone and that the completion of the necessary requisites must be accomplished through knowledge and understanding. The basis for this is history and it is only natural that in this stage in which our knowledge of each other is, to say the least, superficial, the leaders or guiding spirits of our countries should be the object of immediate interest and study. Of these Bolívar is unquestionably one of the outstanding figures of American history and in these our times of social and political readjustment, we shall do well in giving our thoughts to a man who lived his day as intensely as any great soldier has ever lived, but whose mind was permanently fixed on the future with a breadth and loftiness of ideals that emulate our greatest present day ambitions of social justice and international amity and cooperation. This outstanding genial characteristic of achieving the utmost and planning the wisest for human, political and social endeavor will undoubtedly be one of the greatest sources of inspiration for inter-American friendship and continental prosperity.

MIGUEL LÓPEZ PUMAREJO,
Minister of Colombia in the United States.

ECUADOR

The glorious anniversary which we commemorate today is of great significance not only for the nations which owe their existence to the invincible sword of the Liberator, but for all Hispanic America and, I make bold to say, for humanity itself, because the Liberator consecrated the heroic epic of his life to the triumph of those generous ideals of justice and liberty which are not the heritage of one nation or a group of nations, but which have been identified with the history of progress.

For its devotion to the memory of the Liberator, the Republic of Ecuador has earned the distinctive title "preeminent in loyalty", because it followed him with unswerving devotion both in the brilliant days of his glory and in the days of his misfortune and bitterness. Therefore on this day Ecuador pronounces the name of the noble and great-hearted hero with the enthusiasm with which a nation hails the symbol of its destiny.

The glory of Bolívar extends as far and as wide as the horizon of the centuries; it is a summons for the union of the nations of America, which are the stars in his diadem. His statesmanlike vision, his policy of continental amity, forecast the time when nations should respect each other, and laid the foundation for cooperation between those nations which in the past had imbibed the same traditions of nobility and of valor and which for the purposes of history are ever more closely intertwined in fulfillment of a common aspiration.

MANUEL CABEZA DE VACA,
Chargé d'Affaires of Ecuador.

PERU

I deeply appreciate the honor of this invitation to say a few words on Simón Bolívar. It is not necessary for me to speak here about his life, nor do I feel authorized to discourse on so great a man, but if admiration may partly compensate for my deficiencies, I shall have rendered one tribute more to the memory of Simón Bolívar, Liberator of Nations.

The historic moment in which he lived made of Bolívar an Envoy of Destiny. Bolívar was more than a man; he was a force, a symbol, a banner of Liberty that floated over the Andes. Like Napoleon and Caesar, he fought and won; but unlike Napoleon and Caesar, he fought not to conquer but to emancipate. There is no praise too high for men who, like Bolívar and San Martín, sacrificed their lives for the sake of Liberty; emissaries of Providence, or just Supermen, they have won the unfailing admiration of the World and the eternal gratitude of the countries they liberated.

Like every genius, Bolívar was cruel with himself. He exhausted his patrimony; he destroyed his health in crossing the lofty Andes; he made unattainable the love of his life; there was no force capable of halting the victorious march of the great Venezuelan. Triumphant one day, defeated the next, he was like a torrent that carried all before it; untiring, invincible, perhaps because he himself could not escape his own heroic destiny.

He created nations; he organized them; and when his great task was fulfilled, he surrendered to death, thus making human a Life immortal, dedicated to the noblest and most glorious of earthly undertakings: Liberty!

JUAN IGNACIO ELGUERA,
First Secretary of the Peruvian Embassy in the United States.

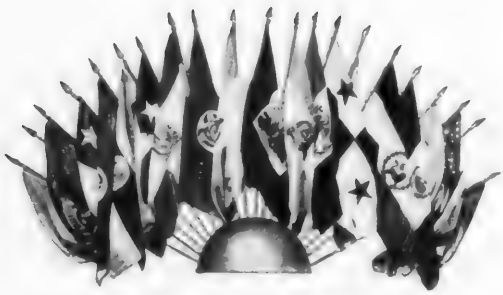
BOLIVIA

The Bolivarian ideal of international peace and cooperation should be the best foundation for all movements for American union and brotherhood. Indeed, I believe it is just in such a moment of uncertainty and bewilderment as we are now experiencing, when the advances which have been made with so much difficulty in the organization of peace run the risk of being nullified, that it is especially needful to inculcate in all men's spirits, and especially in the soul of new generations, the lofty conception of the Liberator. For his ideas had the virtue of arousing a whole world by making it aware of its common destiny.

If the partial breakdown of peace organizations proves, not that they are futile, but that they are still imperfect, it is logical to think that only the development of an appreciation of the processes of law will succeed in creating in the world the degree of moral evolution that is the indispensable foundation for the kingdom of justice and of peace. And in that noble undertaking there is nothing so useful, so profitable, and so surely inspired, as the achievement which tends to spread not only a knowledge of the magnetic personality of the Hero, but also a knowledge of those principles and doctrines embodied in the system of cooperation which was ever his ideal and which continues to be, throughout America, the desideratum of happiness and of union.

ENRIQUE FINOT,
Minister of Bolivia in the United States.

The final celebration of the day was the program of the Liga Internacional de Acción Bolivariana, presented at the Roerich Museum in New York and likewise heard by radio listeners in the United States and Latin America. On this occasion the Minister Resident of Costa Rica in the United States, Señor Don Manuel González Zeledón, read a poem which he had written in homage to the Liberator.



PAN AMERICAN UNION NOTES

COLUMBUS MEMORIAL LIBRARY

New books.— The Library of the School of Economics, Business, and Political Science of the Universidad Nacional del Litoral, of Rosario de Santa Fé, Argentina, celebrated on April 30 its twenty-fifth anniversary as a national public library. On that occasion, the Library published an interesting volume, giving the history of the institution from its beginnings in 1905. Photographs, statistical tables, and legislation affecting the Library supplement the descriptive parts, thus giving its complete history.

Among other books received since last month are the following:

Obras completas de Joaquín V. González. Edición ordenada por el Congreso de la Nación Argentina . . . Buenos Aires [Imprenta Mercatali] 1935. 4 v. front. (v. 1, port.), pl. (v. 1, facsim.) 24 cm. [This handsome edition of the complete works of González was authorized by law of June 22, 1934. The National University of La Plata is in full charge of the compilation and publication of his works, which will include all those previously inedited as well as those already published. The complete works of González comprise 51 titles. These, the first four volumes, include a long prologue by Dr. Ricardo Levene; La Revolución (1885); Proyecto de constitución para la provincia de La Rioja (1887); Manual de la constitución argentina (1897); Legislación de minas (1900); La propiedad de las minas—estudios legales y constitucionales (1913-15); and other shorter studies.]

Menores abandonados y delincuentes; legislación e instituciones en Europa y América, [por el] Dr. Carlos de Arenaza . . . Buenos Aires, Librería y editorial "La Facultad", Juan Roldán y cía., 1934. t. III: 504 p. illus. 27 cm. [Volumes I and II of this work, published in 1929 and 1931 respectively, contained material on 10 European countries. The present volume considers child welfare movements in the United States (with special reference to Puerto Rico), Mexico, Cuba, Haiti, the Dominican Republic, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, and El Salvador. A fourth and last volume will deal with the South American Republics. The author has devoted much time to and written several books on social questions in general and juvenile delinquency in particular.

Leyes sobre bancos y moneda [compilados por el] Ministerio de hacienda de la nación. Buenos Aires, Imp. Luis L. Gotelli, 1935. 5 p. l., [3]–123 p. 24 cm. [This volume includes the six laws passed early in 1935 on money and banking in Argentina, with the message of the President in the latter part of 1934 transmitting the measures.]

La Biblioteca [pública "Estanislao S. Zeballos"] de la Facultad de ciencias económicas, comerciales y políticas, de Rosario, al cumplir veinticinco años desde que el Poder Ejecutivo Nacional la declaró pública. 1910–30 de abril–1935. Santa Fe, Imprenta de la Universidad, 1935. 74 p. plates, ports., tab., diagr. 26 cm.

Memorias scientificas [de] Peter Wilhelm Lund. Traducção do Dr. Leonidas Damasio . . . . Bello Horizonte, Edições Apóllo, 1935. vii, 286 p. pl. (port.) 24 cm. (Bibliotheca mineira de cultura, Volume N° 1.) [These reports were translated from the Danish by Dr. Damasio in 1900. They are now published on the occasion of the centenary of Lund's first studies in natural history made in Minas Gerães. Brazilian anthropology, paleontology and other sciences owe much to his long and arduous work during the early years of the Empire.]

O sabio Dr. Lund e estudos sobre a pre-historia brasileira [pelo prof.] Anibal Mattos . . . . Prefacio do prof. Lopes Rodrigues . . . Bello Horizonte, Edições Apóllo [1935] xxiv, 346, v, vii, iii p. plates, diagrs., maps. 24 cm. (Bibliotheca mineira de cultura, Volume N° 3.) Contents.—Vida e obra de Peter Wilhelm Lund—Ethnographia, Archeologia, Anthropologia, Antiguidade do homem no Brasil. [This is another volume published on the centenary of Lund's work in Brazil. Prof. Mattos discusses his life and works and includes numerous diagrams and maps showing the importance of his discoveries.]

Collectanea Peter Wilhelm Lund [organizada pelo prof.] Anibal Mattos . . . . Bello Horizonte, Edições Apóllo [1935] 268 p. plates, fold. tab., diagrs. fold. map. 24 cm. (Bibliotheca mineira de cultura, Volume N° 5.) [This collection includes some of the studies made by the Danish naturalist in the 1840's and more recent ones by subsequent scientists concerning the same region. A monument was erected to Dr. Lund in Minas Gerães in 1930, in recognition of his great work.]

O Rotary no Brasil e os problemas brasileiros [pelo prof.] Anibal Mattos . . . Bello Horizonte, Edições Apóllo [1935] viii, 237, iii p. plates, ports. 24 cm. [The author describes the Rotary Club movement in Brazil since its inception, reviews the 1934 International Rotary Conference in Detroit, Michigan, and adds a compilation of the resolutions of the first five Brazilian Rotary Conferences, held in 1930–1934.]

Legislação florestal . . . por Paulo Ferreira de Souza . . . . Rio de Janeiro, Diretoria de estatística da produção (Secção de publicidade), 1934. Pt. 1: 184 p., 1 l., xiii p. 23 cm. ([Publicação do] Ministério da agricultura, Departamento nacional de produção vegetal, Serviço de fomento da produção vegetal.) Contents.—Legislação histórica, 1789–1889. [The author states that he has been making this compilation of forestry laws for many years. The first volume covers the century before the establishment of the Republic. It includes all those laws, decisions, regulations and royal orders connected with forestry in Brazil, including excerpts from Portuguese legislation applicable to Brazil.]

Edwin Vernon Morgan, In memoriam. [Preparada e distribuida na] Associação dos artistas brasileiros e Circulo dos amigos das artes plásticas. [Rio de Janeiro, Leuzinger, S. A.] 1935. [30] p. plates, ports. 23½ x 19 cm. [Edwin Vernon Morgan's death in 1934 occasioned deep regret in all America and especially in Brazil, where shortly before he had completed 20 years of service as American Ambassador. The *Associação dos artistas brasileiros* and

the *Circulo dos amigos das artes plásticas* present herewith evidence of their respect for Mr. Morgan and his work.]

Segunda conferencia interamericana de educación . . . . Santiago, República de Chile, septiembre, 1934. [Santiago de Chile, Imp. universitaria, 1935] t. II: 2 p. l., [vii]–xvi p., 1 l., 543 p. 25 cm. Contents.—Temas oficiales. [The topics on the agenda treated in this volume include character education, vocational education, primary and normal education, and miscellaneous matters. Some of the many educators who contributed papers to the conference are: M. Salas Marchán, Carmen Cuesta del Muro, Catalino Arrocha Graell, Graziela Barinaga y Ponce León, Amado J. Fernández, Ana Echegoyen de Cañizares, Diego González, Soledad de Alas, Francis W. Kirkham, John C. Wright, George Johnson, Samuel Zenteno Anaya, Eliseo Otaíza Mardones, Alfredo M. Aguayo, Thomas E. Benner, Enrique Cañas Flores, Santiago Peña y Lillo, Dario E. Salas, Gilda B. Carissimo, Armando Rojas Castro, Miguel R. Avila, Luciano Martínez Echemendía, María González, Teodoro Picado Michalsky, Harold Benjamin, H. J. Smith, J. Cayce Morrison, W. W. Charters, Tracy F. Tyler, Claudio Salas, Domingo Durán, Catherine Cook, Valentín Retamal, Dr. Eugenio Cienfuegos, Leo C. de Bray, Víctor Mercante, Hugo Lea Plaza, Roberto Verdaguer y García, Rogelio Muñoz Martínez, Waldo Stevenson, Adolfo Cienfuegos y Cámus, Elena Torres, and Rafael Ramírez.]

Anuario Cab, comercio—industrias—profesiones, 1935. Primera edición . . . . Santiago de Chile, Editores: Empresa de avisos C. A. Bofill [1935] 828, 291 p. 27 cm. [This is the first issue of a yearly guide which promises to be a complete directory to Chilean commerce and industry. It includes, in addition to the industrial firms of all the more important cities, a directory of public officials, a statistical summary of commerce and various industries, lists of credit institutions, stock companies, exporters, and daily and other periodicals, and the tariff as of December 24, 1934, with related laws as supplements.]

Mujeres de América, por Bernardo Uribe Muñoz . . . . Medellín, Imp. oficial, 1934. xxi p., 1 l., 460, a–d p. illus. (ports.) 24 cm. [This compilation includes the biographies of some of the best known contemporary American women. The majority of the biographies were written by the subjects themselves, and in many cases photographs were furnished. The collection includes representatives of Argentina, Bolivia, Colombia, Cuba, Chile, the Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Puerto Rico, Uruguay, and Venezuela. Among these women are novelists, short-story writers, poets, journalists, teachers, lawyers, essayists, dramatists, a genealogist, a historian, a pianist, a physician, and an artist.

Historia ferrovial de Costa Rica [*y*] *Galería del progreso nacional* [por] Joaquín Fernández Montúfar. (San José, pref. 1934] 221 p., [4] l. incl. illus., plates, ports., diagrs. [260] plates, incl. ports. 25 cm. [This long history of Costa Rican railways gives the whole story of the Atlantic and the Pacific roads. The author continues with a discussion of ports and harbors on both coasts and a chapter on highway development, and concludes with two chapters discussing the development of agriculture in general and coffee in particular. The *Galería del progreso nacional* is a collection of 260 plates, each with a descriptive caption, showing the modern conditions prevailing throughout the Republic.]

Libro del centenario de Juan Santamaría, 1831 29 de agosto 1931, y algunas otras páginas cívicas de Alajuela; [publicación del] Instituto de Alajuela. . . . San José, Imprenta nacional, 1934. 312 p. plates (incl. ports., fold. facsim.) 21 cm. [A collection of addresses delivered at the time of the Santamaría centenary in 1931 is here presented as a civic offering to the youth of Costa Rica. The second and third parts of the volume deal with Alajuela, the birthplace of the hero. They comprise a series of historical essays written at the time of the

one hundred and fiftieth anniversary of the foundation of Alajuela and biographies of eleven illustrious citizens of that city.]

La novela en Cuba: sus manifestaciones, ideales y posibilidades; discurso leído por el Dr. Salvador Salazar, Presidente p. s. de la Academia nacional de artes y letras, en sesión solemne de apertura del curso de 1934 a 1935, celebrada el domingo 28 de octubre de 1934. . . . Habana, Imp. Molina y cía., 1934. 45 p. 25 cm. [This address, though brief, is an interesting historical and critical essay on the Cuban novel. It is followed by a short poem entitled *Misterio*, by Dulce María Borrero, read before the Academy on October 28, 1934, and the report of the secretary general of the Academy submitted at the beginning of the year 1931–32.]

Précis méthodique d'histoire d'Haïti: cinq siècles d'histoire—1492–1930, par le docteur François Dalencour. . . . Port-au-Prince, Chez l'auteur, 1935. 3 p. l., 208 p. 27 cm. [Dr. Dalencour defines history as "the account of events of all kinds which have taken place in the world or in a certain part of the world, and in which man has played the leading role. The history of Haiti is therefore the account of the events which have taken place in Haiti since the time of the earliest known inhabitants, i. e., the Indians, down to the present." He divides the history of Haiti into seven periods: the Indian era; the Spanish era; the era of adventures; the French era; the War of Independence—the heroic era; complete national independence; and the American-Haitian era.]

Recent periodical acquisitions.—New magazines or those received for the first time are listed below:

Corporación frutícola argentina, revista official. Buenos Aires, 1935. Año 1, N° 1, enero de 1935. 36 p. ports. 29x20 cm. Monthly. Editors: Comisión de prensa, Corporación frutícola argentina. Address: 441 Agüero, Primer piso, Buenos Aires, República Argentina.

Norte; periódico literario. Buenos Aires, 1935. Año I, N° 1, 1° de abril de 1935. 4 p. 34½x25½ cm. Monthly. Editor: Fermín Estrella Gutiérrez. Address: Beauchef 245, Buenos Aires, República Argentina.

Monthly economic survey of Chile; [publication of the] Ministry of foreign affairs and commerce. Santiago de Chile, 1935. N° 3, March, 1935. [16] p. tables. 27 x 19 cm. Address: La Moneda Palace, Santiago, Chile.

América española. Cartagena, 1935. Tomo I, N° 1, mayo, 1935. 96 p. 25x17 cm. Editor: G. Porras Troconis. Address: Editorial América española, Cartagena, Colombia.

Revista de derecho (órgano de la Asociación de abogados de Santo Domingo). Santo Domingo, 1935. Año I, N° 2, 15 de mayo de 1935. 30 p. 23½x16 cm. Monthly. Editor: Aníbal Sosa Ortiz. Address: Asociación de abogados de Santo Domingo, Santo Domingo, República Dominicana.

Revista musical Ariel. México, 1935. Año I, N° 1, mayo de 1935. 28 p. illus. (ports.) 23x17 cm. Monthly. Editor: A. Domínguez Portas. Address: Prim 32–3 A, México, D. F., México.

Don Quijote; publicación del Club Miguel de Unamuno de la sección nocturna del College of the City of New York. New York, 1935. No. 4, junio–noviembre, 1935. 34 p. 31x23 cm. Half-yearly. Address: Box No. 101, College of the City of New York, Main Building—138th St. and Convent Avenue, New York, N. Y.

Unión; órgano oficial del capítulo Zeta de la fraternidad Fi Iota Alfa [asociación de estudiantes latinoamericanos] Nueva York, 1935. Año I, N° 1, 30 de abril de 1935. 11 p. illus. 31x23 cm. Address: P. O. Box 55, Station, I New York, N. Y.

PAN AMERICAN PROGRESS

PRESIDENTIAL MESSAGES

Paraguay.—After reporting to Congress in detail regarding Paraguay's position in the Chaco conflict (prior to the mediation and peace negotiations sponsored by other American nations), President Eusebio Ayala dealt with current economic and social problems in his message delivered on April 1, 1935. For instance, he scored the "false theory" which gives preference to foreign credit in financing the country's needs, suggesting a "rational organization of the domestic security market" and then said that for the maintenance of sound public finance it was essential to "systematize government expenditures, regulate the credit obligations of the State, faithfully keep up the public debt services, and seek current credit for the National Treasury". To carry out plans for a better control of expenditures, an appropriation was requested for expert aid in establishing a modern system of accountancy and supervision.

The population problem seems to be the cause of grave concern in Paraguay. One difficulty for which measures are soon to be taken is that arising from a large number of agricultural workers who, having no land of their own, "take no interest in their tasks, migrate often and trespass upon private property, to the detriment of national wealth, public order, and moral and physical health", the President said. The administration is also sponsoring a colonization program, with a sound immigration plan as its basis. The country would be prepared to assimilate new inhabitants, preferably farmers, giving them facilities for the acquisition of lands and helping them during the period of acclimation.

Peru.—In a radio address delivered on May 10 to the nation, President Oscar R. Benavides reviewed the accomplishments of his administration during the first two years of his term. He spoke of the close and cordial relations maintained with all nations of the world, stressing the "spiritual and material bonds with the peoples of America". Special mention was made of the Protocol of Friendship and Cooperation signed last year with Colombia; the efforts being made to reach a satisfactory solution of the boundary controversy with Ecuador; the prospective consideration by the Peruvian Congress of the commercial pact signed with Chile on March 17, 1934, and the similar treaties now under negotiation with Argentina and

Great Britain. The President reiterated the fraternal feeling of Peru toward Bolivia and Paraguay, the Government having exerted "at all times its friendly influence on behalf of peace" in the Chaco.

In the fiscal year ended April 30, 1935, there was an increase of 75 percent in the foreign trade, with a corresponding rise in customs revenues, over figures of the previous year. An appreciable increase was likewise recorded in the revenues from direct taxation; in bank deposits, as well as in the banks' available cash on hand, discount operations, loans, etc.; while "bank stock, mortgage bonds and government securities reached a level seldom attained" in the nation's history. The Government expressed the hope that all creditor nations would cooperate in an economic policy which would permit increased Peruvian exports, as a means of enabling the country "to meet the debts contracted abroad by preceding administrations, and which the Nation is pledged to pay". The Chief Executive dealt extensively with the policy pursued by the Government in connection with the monetary problem created by the rise in the price of silver, especially the suppression of hoarding and speculating. Moreover, instead of taking advantage of the situation to issue new fractional currency of very little intrinsic value, the administration placed the matter in the hands of the Central Reserve Bank to deal with it according to the provisions of its charter, "for the protection of the public interest and to assure a sound national currency."

President Benavides expressed great satisfaction at the progress attained in the field of public education. The greatest amount previously spent by the government on this item had been 7,500,000 soles, the sum appropriated in 1932. "In 1934", he said, "my Government spent 9,500,000 soles, which represents an increase of more than 25 percent, and I may add that this figure will be exceeded in the course of the current year." Since 1932, the record year for enrollment, also, the school population has increased by more than 20,000 pupils, giving work to approximately 2,000 teachers who had been unemployed. Regarding a plan of instruction, he suggested that all efforts be concentrated on perfecting elementary instruction, "giving it, above all, a national and utilitarian character, increasing the number of technical schools, and disseminating in all others a knowledge of agricultural and farm matters".

Argentina.—In his address to the Argentine Congress on May 15, marking the opening of the 72nd legislative session, President Agustín P. Justo reviewed the work accomplished during the first half of his term of office and expounded the policies to be pursued by his administration in order to consolidate the ground gained by the Republic in its fight against economic depression. The President also laid plans for purging the existing political parties of the evils which beset them and cause "the people to lose faith in their leaders and,

consequently, in our governing institutions". In urging the Congress to study this problem, which he deems of vital importance, and to take the measures necessary to its solution, he asserted that Democracy must provide the people with able leaders or the doors would be opened to demagogy and, ultimately, to dictatorship.

The rapid strides of the nation toward economic recovery, the President said, may bring back certain social and labor difficulties in the industrial districts and in densely populated centers, a situation which calls for adequate preventive legislation looking toward the establishment of better relations between capital and labor. The increasing organization of workers into unions should facilitate, rather than hinder, the promulgation of effective labor legislation to prevent conflicts which would benefit no one. Joint boards, labor tribunals and conciliation and arbitration commissions were specially recommended "in order to insure good relations and harmony between those who jointly create our national wealth". A living wage is essential to the material and spiritual progress of the population, the President added.

In foreign relations, the Republic has maintained "its traditional spirit of tolerance, equanimity and solidarity", as revealed by the actions of the Argentine delegation before the League of Nations. The Anti-War Pact, sponsored by the Ministry of Foreign Affairs, has been accepted by the 21 American nations, and also by a large number of European and Asiatic governments. Argentina signed the Briand-Kellogg Peace Pact. Despite the difficulties which have prevented a solution to the problem created by interruption of the Transandine railway service—particularly the contention that prospective revenues do not justify the cost of reconstructing the sections destroyed by the Mendoza floods—the Argentine Government is bending every effort to meet the situation, "conscious of what this line means to the sister Republic" of Chile.

When the 1934 budget was drafted, it was estimated that the deficit for the fiscal year would amount to 20 million pesos; this estimate included the deficit of the National Council of Education, and took into consideration the fact that, according to the laws then in force, the contribution to the pension fund and the financial aid to the Provinces would have to be met with bond issues. Fortunately, however, the deficit was practically wiped out, for the total expenditures exceeded the revenues by barely a million pesos. With regard to the expenditures which are met with cash out of the ordinary revenues, that is, for general administration, social assistance, and service on the public debt, the economies practised in the last three years have brought about a reduction of 131,000,000 pesos as compared with the actual outlay in 1930. The public debt service fell to

232,400,000 pesos in 1934, or 55,600,000 less than in 1932, practically equalling the figures for 1930, "thanks to the sharp depreciation of the pound and the dollar; to the absorption of exchange differences by the *exchange margin* account; and to the conversions effected".

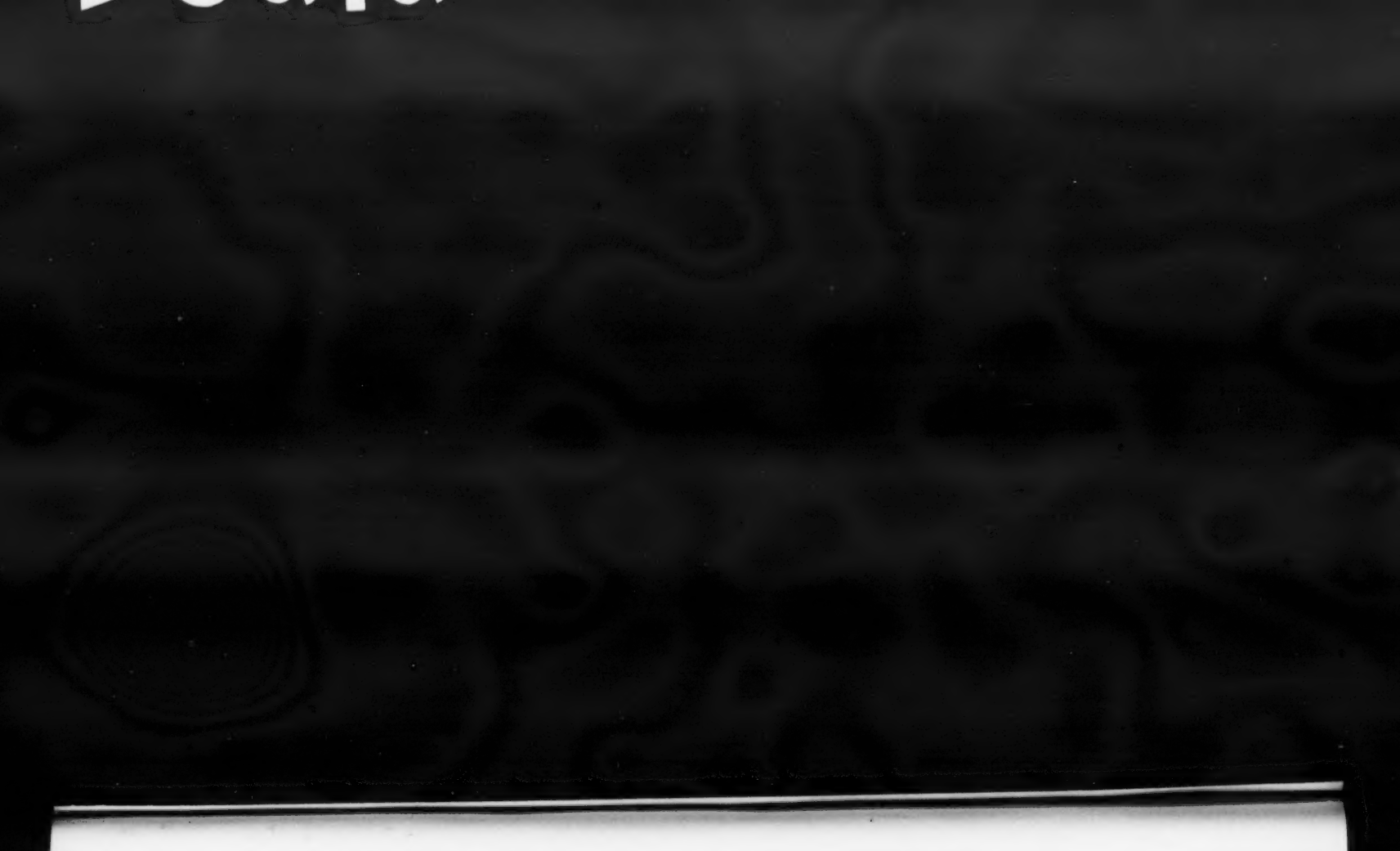
The traditional policy of covering the cost of public works by means of bond issues should be modified, according to the President, for it "tends to burden the budget with increasingly large sums". The amount spent in 1934 was 110,200,000 pesos "without counting the money spent on roads which, although bound to benefit future generations, are being paid for out of cash revenues contributed by the present population".

The tax situation was reported as highly satisfactory. Necessity forced the National Government to establish income and sales taxes, and to increase some customs duties and internal taxes. An additional levy of 10 percent on imports has been maintained. Burdensome as these taxes have been to the taxpayer, the President insisted that "without them it would have been impossible to maintain the financial stability of the country." The income and sales taxes and the 10 percent additional duties yielded 151,600,000 pesos in 1934, and 435,200,000 pesos in the course of the past three years. To these must be added the naphtha tax which produced 42,300,000 pesos in 1934 and 99,000,000 during the three year period, this revenue having been set aside to cover the cost of the road building program. Meanwhile, the unification of the internal tax systems which previously were controlled by the individual Provinces and which "tended increasingly to become instruments of economic warfare which were disrupting the economic unity of the nation" through the establishment of differential duties, has proven very successful, so that now Argentina has "a single economic territory governed by uniform fiscal laws which allow products to circulate in one direction or another, by the payment of a single tax, and enable them to be sold in any part of the Republic, regardless of the Province of origin", assuring to the Provinces "increasing revenues, paid punctually and without collection expenses."

Considerable progress has been attained in the campaign against illiteracy through intensification of elementary instruction the country over. Fundamental reforms are proposed in the school system, particularly with regard to *educación media* (the years between the elementary grades and the university, often including normal and vocational courses) "modifying its basic organization in accordance with the policies demanded by present and future conditions." A committee of experts has completed a careful survey and submitted a report on the situation. Its recommendations, which call for a more comprehensive plan of study and greater efficiency in the teaching of

each subject, would be applied especially to secondary and normal schools. The Chief Executive reported complete order and discipline in the universities, "a condition essential to the realization of the lofty aims of these institutions of learning." In general, he saw positive evidence of a "greater inclination toward the study of science, literature, history and law throughout the land, owing to the activity of research institutes and the splendid opportunities afforded by public lectures in universities and in other advanced cultural centers."

The economic outlook is decidedly favorable, based on the record of the year 1934 and the first part of 1935. Commercial transactions increased by 15 percent over the volume registered in 1933; business failures have decreased; collections have improved; and there has been an appreciable increase in savings deposits. Notwithstanding the difficulties facing Argentine foreign trade, there was a favorable balance of 328,500,000 pesos in 1934, while in the first quarter of 1935 Argentine exports had exceeded the imports by 142,000,000 pesos. Nevertheless, the President declared that the country was still "far from prosperity", and that to bring about real recovery, the necessary reforms must be carried out which would prevent the repetition of past mistakes. Among these reforms, President Justo expects particularly good results from the new banking laws approved by the National Congress, establishing a Central Bank and an Institution for the Liquidation of Frozen Bank Assets.[1]

The message is not so optimistic, however, with regard to the meat industry. Despite the creation of a board for the purpose of stimulating the meat exports by distributing subsidies financed with the proceeds from exchange operations, and the increase in exports to Japan, the prospects of finding new markets for this Argentine product are not considered very favorable at present. The occasional dispatch of meat to Italy for the army and the substantial increase of exports of preserved meat to the United States are only temporary palliatives, it was stated, which do not cover the heavy drop in shipments to Great Britain caused by restrictions intended to protect British production.—F. J. H.

[1] See "Banking and Monetary Reforms in Argentina", by H. Gerald Smith, in the BULLETIN of the Pan American Union for June 1935.